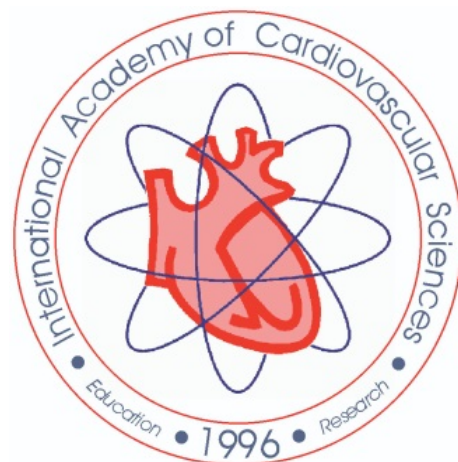


Promoting Cardiovascular Education, Research and Prevention

CV Network

THE OFFICIAL BULLETIN OF THE INTERNATIONAL ACADEMY OF CARDIOVASCULAR SCIENCES

PUBLISHED WITH THE ASSISTANCE OF THE ST. BONIFACE
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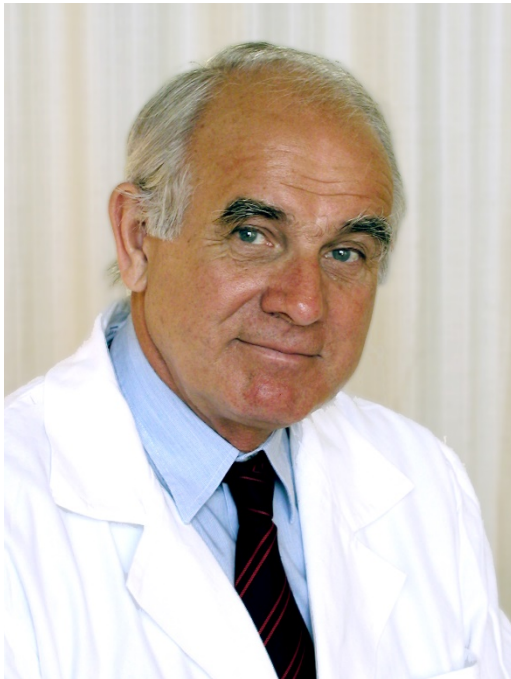
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My 25 years with the International Academy of Cardiovascular Sciences

Bohuslav Ostadal, MD

*Former President International Academy of Cardiovascular Sciences
Institute of Physiology, Czech Academy of Sciences, Prague, Czech Republic*



Dr. Bohuslav Ostadal

The International Academy of Cardiovascular Sciences (IACS) was founded in 1996 on the proposal of Professor Naranjan Dhalla, outstanding cardiologist and exceptional scientific manager. It has been a lifetime desire of Dr. Dhalla to clearly define the scientific basis of cardiology. He focused his attention in this area because he early realized that heart disease is a major killer in the Western world and its trend is on the rise in developing countries. The foundation of the Academy would be impossible without his superior leadership in the field of experimental cardiology, his strong commitment to excellence in heart research, his clear vision for connecting basic sciences with clinical cardiology and his deep devotion to helping young cardiologists reach their objective. Established by renowned cardiologists, both experimental and clinical, the Academy provided the organizational structure for the world-wide development of cardiovascular research and education. The founders of the Academy were convinced that the effective collaboration of experimental and clinical cardiologists may improve this unfavorable situation. I was

very pleased and honored by the exceptional possibility to be involved in the enthusiastic foundation and development of the new Academy.

One can ask whether world cardiology needed one more international society. I was from the whole beginning deeply convinced that the only answer is yes, and I would like to briefly explain my arguments. I am old enough to be able to follow the development of the international cardiological community, particularly the relationships between the clinical and experimental cardiologists, from the early sixties of the last century. European Congress of Cardiology in 1964 was organized in Prague. From the total number of accepted presentations only three were devoted to the experimental cardiology. This fact stimulated the congress participants, Richard Bing, outstanding cardiologist, the father of cardiac metabolism, Eörs Bajusz, a brilliant Hungarian-American biologist and my teacher, experimental cardiologist Otakar Poupa to undertake the steps in order to improve this abnormal situation. Their very enthusiastic effort to promote basic cardiology led finally to the foundation of the International Study Group for Research in Cardiac Metabolism in Dubrovnik, former Yugoslavia, in 1968. The name was later – on the suggestion of Dr. Dhalla, one of its founders – changed into the International Society for Heart Research. Unfortunately, during the further development, the thinking and philosophy of experimental and clinical cardiologists became very divergent. The problems were of course on both sides: extreme concentration on evidence based medicine among clinical cardiologists and massive orientation of experimental cardiologists on the molecular biology became the leading reasons. This development led the officials of the American and European Cardiological Societies to the introduction of basic research sessions into the regular scientific program of their congresses. This laudable step was important contribution to the better understanding between both communities. The disadvantage was, however, the size of the main congresses, often exceeding 20 000 participants, and thus the complicated informal communication between the clinical and experimental cardiologists.

It is more than clear that only close cooperation between the clinical and experimental cardiologists is the driving force of the progress of the contemporary modern

cardiology. More intimate and friendly atmosphere of the meetings of the IACS thus creates the productive background for the effective discussion. English term “Academy” is derived from the ancient Greek “Academia”, the grove of trees and gymnasium outside of Athens where Plato taught, based on the name of the supposed former owner of that estate, the Attic hero Akademos. According to the Webster dictionary, “Academia” continues to provide scientific education and research. Alternatively, it means the life, community or world of teachers, schools, and education. In accordance with this definition, the main goal of IACS is, therefore, the continuous education of the cardiovascular community with the aim to contribute to the translation of basic knowledge into prevention, improved diagnosis and therapy of cardiovascular disease worldwide. In addition, IACS continues in the recognition of achievements of cardiovascular investigators by Fellowships of the Academy as well as major prizes to distinguished scientists as well as travel grants and awards for young investigators. The actual information about the life of the scientific society is an important presumption of the effective function; IACS publishes very successfully the official bulletin CV Network.

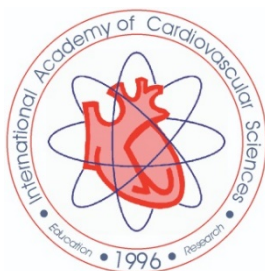
My relationship to the Academy is very personnel since I am connected with this society from the whole beginning. It is, therefore, understandable, that Academy significantly influenced also my scientific life during the last 25 years. Since the very beginning of the scientific career, my main area of research has been focused on the development of the heart structure and function under normal and pathological conditions. Developmental approach in medical sciences and particularly in cardiology offers new possibilities in the experimental studies of pathogeny, prevention and therapy of cardiovascular diseases. The importance of the developmental approach for experimental and clinical cardiology is indisputable. Clinical-epidemiological studies have shown that the risk factors of serious cardiovascular diseases, such as atherosclerosis and ischemic heart disease, are present already during the early phases of ontogenetic development. They are thus no longer diseases of the fifth and higher decades of life, rather, their origins and consequences may be influenced by risk factors acting during development. It follows that experimental studies on the pathogenetic mechanisms of these disturbances

must shift to the early ontogenetic period. Recent advances of new methodology, particularly molecular biology and genetics, may substantially help in the laborious search for better understanding of the underlying mechanisms. Nevertheless, molecular analysis in developmental cardiology is unthinkable without comprehensive and well integrated view of the field.

IACS markedly extended our possibilities of the international cooperation, essential for the effective contemporary research. Dr. Dhalla helped me to join the international cardiological scientific community and invited me to work with him in Winnipeg. I was not alone, several my collaborators from the Department of Developmental Cardiology, Institute of Physiology, Czech Academy of Sciences in Prague had the opportunity to work with him and his coworkers in Winnipeg. The cooperation was very effective: many common publications in prestigious journals as well the edition of 6 books by Springer are the best evidence for this. I am very grateful for his long-lasting support and friendship.

I was very surprised, but simultaneously very pleased and honored by the result of presidential election of IACS in 2014. I realized very well the high responsibility connected with the chairmanship of the unique scientific society composed of the esteemed experimental and clinical cardiologists from the whole world. And first of all it was necessary to continue in the highly appreciated effort of the founder, Dr. Dhalla as well as of my predecessors in the presidency, Howard Morgan, Stephen Vatner, Sir Magdi Yacoub and James T. Willerson. My unquestioned advantage was the extremely creative and friendly atmosphere inside of the Executive Council, represented by outstanding cardiologists and enthusiastic organizers. During my five-year period (2014-2018), IACS organized or sponsored a total of 30 meetings in 10 different countries (Argentina, Brasil, Canada, Cuba, Hungary, India, Peru, Serbia, Slovakia and USA). I am convinced that the coming years will be even more effective.

In conclusion, International Academy of Cardiovascular Sciences demonstrated its viability, scientific tact, enthusiasm and utility. I am convinced that it has received the strong position in the international cardiological community. My sincere wish is, therefore, to keep the Society in the good condition for the next 25 years.



Professional Journeys of Eminent and Influential Cardiovascular Investigators

At the occasion of the 25th Anniversary of IACS, President Dr. Roberto Bolli, is most pleased to announce the selection of following ten Eminent and Influential Cardiovascular Scientists to recognize their superior achievements throughout their professional career:

- | | |
|--|--|
| 1. Dr. Peter Carmeliet: Leuven, Belgium | 6. Dr. Martin Morad: Charleston, USA |
| 2. Dr. Buddhadeb Dawn: Las Vegas, USA | 7. Dr. Grant Pierce: Winnipeg, Canada |
| 3. Dr. Peter Ferdinandy: Budapest, Hungary | 8. Dr. Heinrich Taegtmeyer: Houston, USA |
| 4. Dr. Gerd Heusch: Essen, Germany | 9. Dr. Rhian Touyz: Glasgow, Scotland |
| 5. Dr. Bruce McManus: Vancouver, Canada | 10. Dr. Balwant Tuana: Ottawa, Canada |

These individuals with diverse expertise were invited to record their professional journeys, which we believe will serve as a source of inspiration to cardiovascular community for finding solutions to complex problems in preventing heart disease. Professional Journeys of some of these individuals who received this special honour by the Academy are described below.

Professional Journey of Dr. Peter Carmeliet

Peter Carmeliet, MD, PhD

*Laboratory of Angiogenesis and Vascular Metabolism, Center for Cancer Biology,
Professor of Medicine, Department of Oncology, University of Leuven, Leuven, Belgium*



Dr. Peter Carmeliet

Professional flutist, engineer or physician scientist: that was the challenging career choice the young Peter

Carmeliet was facing at the age of 18 years. Following his passion for biology as a child, Peter decided to follow the footsteps of his father, the late Professor Edward Carmeliet, who is considered one of the founding fathers of cardiac cellular electrophysiology.

Professor Peter Carmeliet is currently head of the Laboratory of Angiogenesis and Vascular Metabolism and former director of the Vesalius Research Center at the Flemish Institute of Biology (VIB) and University of Leuven, now called the Center for Cancer Biology (Leuven, Belgium). He graduated as Doctor in Medicine at the University of Leuven in Belgium in 1984. In 1989, he received his Ph.D. degree and performed a postdoctoral training at Harvard Medical School (Boston, USA) and the Whitehead Institute, MIT (Cambridge, USA). Upon return to Leuven in 1992, Peter started up his own research group. In 2000, he became Full Professor at the faculty of

Medicine at the University of Leuven. Carmeliet was also visiting Professor at the Cleveland Clinic and the Dartmouth University (USA), and is currently visiting scientist at the Kitasato University (Kanagawa, Japan), Honorary Skou Professor at the Aarhus University (Aarhus, Denmark). He also holds positions and supervises a laboratory at the Sun-Yat-Sen University (Guangzhou, China) and Aarhus University.

Peter Carmeliet is one of the world most renowned scientists in the field of angiogenesis (formation of blood vessels). His research on the nature and mechanisms of angiogenesis and the link to neurodegeneration (he discovered an important disease-modifying role of the key pro-angiogenic factor VEGF in lethal paralyzing amyotrophic lateral sclerosis) not only fundamentally changed the biomedical field and textbooks, it also provided a better understanding of these central mechanisms in health and disease. Carmeliet is a visionary pioneer, not afraid of taking risks and leaving his comfort zone, and tapping into and bridging new fields, believing that interdisciplinary expertise holds strong promise for advancing science. He invested royalties of his earlier licensed work into pioneering new fields, such as endothelial cell metabolism.

Not frightened of switching tracks, from hemostasis to angiogenesis and neurodegeneration, from regulation of angiogenesis by growth factors to endothelial cell metabolism, and recently to vascular heterogeneity at the single cell level, it is not a path many researchers would readily consider or dare to jump in to. For Peter, this is his second nature. Realizing the challenging conditions to combine research with a clinical career in Belgium in the early 1980s, Peter decided to no longer continue his training in internal medicine, and instead chose to devote his life to research, even though this was not advised by his peers.

Carmeliet's preeminent research career is a remarkable line up of "firsts", the result of an unsatiable scientific hunger, creative mind, never-ending willingness to break new grounds, a 'sixth sense' for recognizing early the next important fundamental biological question and disruptive technologies and a strong drive to create new translational therapeutic opportunities for the benefit of society. Peter Carmeliet is a game-changer, guiding the field to unknown territories and shaping new directions, continuously rejuvenating the scientific community with novel concepts. Yet, from the work during his three years of postdoc, he did not have any first author publication in top journals when postulating for a job as group leader, but he had

invested in acquiring the gene knockout technology, which enabled him to publish the first knockout mice in the hemostasis and angiogenesis fields upon his return to Leuven.

At the start, Carmeliet's research covered various aspects of hemostasis and cardiovascular disease. With the constitution of VIB and the support of (the now Emeritus) Professor Désiré Collen (a giant in the hemostasis field), Peter made landmark contributions to the field of cardiovascular biology. He was the first to generate gene knockout mice for virtually every important component of the fibrinolytic and coagulation system, a collection of mouse models that was made accessible to the scientific community and that are still being used by various research groups worldwide. His team also generated knockout and floxed mice of the VEGF-hypoxia signaling axis, which are still widely used by many laboratories worldwide.

As a newcomer in the angiogenesis field, Carmeliet's breakthrough entree was the discovery of a crucial role for VEGF in angiogenesis in 1991, as revealed by the lethal haplo-insufficient phenotype of mice, lacking a single VEGF allele. During his postdoc at the Whitehead Institute, Peter came across an article about the discovery of VEGF (by N. Ferrara), the *in vivo* role of which was not studied yet. Peter's findings that removing even only a single VEGF allele caused severe vascular defects resulting in embryonic lethality, were truly overturning the angiogenesis field and beyond (*Nature* 1996). This observation is today still a classic in the angiogenesis field amassing >3,000 citations. The impact of this seminal study can be judged from the phenomenal series of follow-up studies on the genetics of angiogenesis by Peter as well as by others. Ultimately, these findings constituted the basis to develop anti-VEGF therapy for various cancer and eye diseases. Remarkably, Peter's risk-taking entrepreneurship is illustrated by his decision to start generating several of these knockout mouse projects, even though he knew that his competitors were far ahead (VEGF, urokinase, tissue factor), yet the Carmeliet lab succeeded in generating high impact publications.

Peter Carmeliet also studied another member of the VEGF family, namely placental growth factor (PlGF), which he discovered to be a disease-specific growth factor, redundant in health but involved in several pathologies, including cancer and ocular disease. In a collaborative project, Peter and the research group of Professor Rakesh Jain, showed the potential of blocking PlGF for the treatment of pediatric brain medulloblastoma (2013). The impact of these discoveries is illustrated by the fact that two biotech companies started clinical testing of anti-PlGF

antibody treatment (TB-403) for pediatric medulloblastoma (Oncurious N.V., oncurious.com, phase I clinical trial) and diabetic retinopathy ([Oxurion N.V.](http://Oxurion.N.V.), phase II clinical trials). With 7 out of 8 relapsed, out-treated medulloblastoma patients responding to anti-PIGF treatment by disease stabilization (some for >1 year), the phase I clinical trial yielded a better outcome than expected.

Ten years ago, Carmeliet surprised the vascular biology field by establishing a conceptual cornerstone for an entirely new field of investigation, that of “endothelial cell metabolism” and its therapeutic potential to promote or inhibit angiogenesis. Carmeliet postulated that, for angiogenic factors to mediate their action, a change in endothelial cell metabolism would be required. The Carmeliet lab single-handedly pioneered this new field of endothelial cell metabolism, which has now become a rapidly emerging field and a prominent topic at international symposia far beyond the angiogenesis field. Its impact is also reflected by the numerous reviews from Peter’s group in top journals (*Cell Metab*, *Nature*, *Nat Metab*, *Science*, etc.) as well as by News & Views and Editorials on several of the lab’s publications.

His meticulously performed, highly innovative, multidisciplinary endothelial cell metabolism studies demonstrated the importance of endothelial cell metabolism in regulating angiogenesis in health and disease. Peter takes great care in translating his basic findings to clinical use. By using endothelial cells from patients and applying (single cell) multi-omics, he characterized the metabolic transcriptome at the single cell level, resulting in, among others, a single endothelial cell atlas of various murine organs, of human and murine lung cancer and ocular disease, revealing endothelial cell subtypes with immunomodulatory features. Once more, Peter did not shy away of transforming his lab again, now converting part of his wet lab into a dry lab, thereby creating a powerful combination.

By pioneering the endothelial cell metabolism field, and obtaining breakthrough insights, the Carmeliet team revolutionized the angiogenesis field, offering novel therapeutic strategies. Although Peter is a researcher in heart and soul, he has never abandoned his commitment to make societal impact with his medical background, and remains genuinely interested in developing novel strategies to treat diseases. Carmeliet fosters his contacts with clinicians, which keeps him up-to-date with clinical important questions. Indeed, within 10 years after establishing a novel field of endothelial cell metabolism,

the work of Carmeliet’s team resulted in a phase II clinical trial, testing the effects of dietary ketone bodies for relieving lymphedema (for whom no causal treatment is available, only symptomatic relief), illustrating the potential of Carmeliet’s innovative thinking in clinical applications.

Carmeliet’s current research continues to focus on understanding the molecular basis of angiogenesis in health and disease; and developing new therapeutic strategies, inhibiting or stimulating vessel formation for respectively cancer/eye disease or ischemic diseases. Using single cell analyses, Carmeliet recently identified “immunomodulatory endothelial cells”, possible new targets for alternative immunotherapy, leading to co-founding the spin-off company *Montis Biosciences* (montisbio.com) to develop novel immuno-oncology therapies by targeting the interaction of peri-vascular macrophages with tumor endothelial cells.

Together, these findings illustrate that Carmeliet’s research projects not only fundamentally contribute to shaping the (lymph)-angiogenesis field, but also offer novel therapeutic opportunities to address unmet medical needs. Carmeliet has built his scientific career by exploring the unknowns, merging acquired knowledge with a hunger and audacity to reach out to the unreachable. He is listed as highly cited researcher in the Clarivate Analytics list, a recognition for his truly impactful and innovative research.

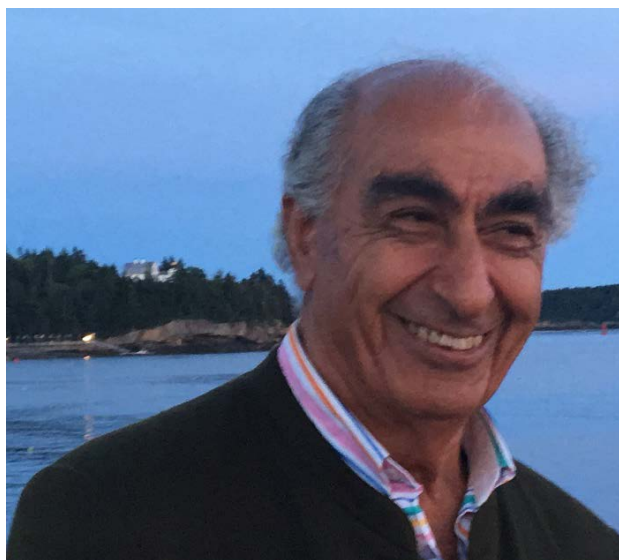
Carmeliet’s leadership is paralleled by his generous community service, for instance by sharing numerous research tools (knockout mice, bioinformatics tools, resources), educating the scientific community (presentations at international meetings; writing reviews, perspectives and editorial comments; organizing international scientific meetings and serving on the editorial board of major journals (including *Science*, *Cancer Cell*). His work is widely cited (>96.238 citations; h-index: 146). He received invitations to present his work at numerous (inter)-national meetings. In addition, Peter Carmeliet has been recognized internationally by numerous prestigious awards, including the Francqui Prize in Biological and Medical Sciences (2002), the Baillet Latour Prize (2005, jointly with Désiré Collen), the Ernst Jung Prize in Medicine (2010) and the Heineken Prize for Medicine (2018). In 2015, King Filip of Belgium granted him the Noble title of ‘Baron’. Moreover, his groundbreaking research and exceptional contributions to the field of angiogenesis were recently recognized by an International Honorary Membership of the prestigious American Academy of Arts & Sciences. Fewer than 25 Belgians preceded Professor Peter Carmeliet since the Academy was founded in 1780 by John Adams, the last one more than 20 years ago.

As group leader, Peter aims to create an international atmosphere in the lab and encourages junior scientists to be trained at a top level, to collaborate with outstanding scientists, and to combine creativeness with scientific precision, inviting them to make out-of-the-box contributions. A creative, challenging idea from a master student is taken as seriously as a suggestion from an experienced postdoctoral fellow. Carmeliet's impact on

scientists is one of true inspiration, he is able to motivate them to reach goals they considered unachievable. His talent to develop their reasoning skills and critical thinking, and his devotion to research are contagious. For Peter, it is infectious to see how well the career of his alumni fare. Many of them obtained high level positions in academia or industry, and previous trainees became successful group leaders in world-leading institutes.

Scientific Journey of Dr. Martin Morad

Martin Morad, PhD, FISHR, FIACS
Director of Cardiac Signaling Center,
Professor, University of South Carolina, Columbia, USA



Dr. Martin Morad

My scientific journey in life-sciences over the past 5 years has been like walking through the magical *land of OZ*, a land full of toys and boxes of secrets to pluck and explore. Using novel, often home-made technologies, my students and I probed the signaling pathways that regulate various biological systems, including mechanisms regulating cardiac excitability & contractility, ion channel biophysics & pharmacology, brain receptors, developmental biology, and comparative physiology. It is difficult to describe the joy and euphoria that accompanies the breakthroughs in scientific discovery or anguish that follows failed experimental approaches. The story of joys and anguishes of scientific quests will remain my cherished personal memory, but its official record has been chronicled in seven edited books and more than 250 peer-reviewed publications, including 20 papers in *Science* and *Nature*, 8

in *PNAS*, 6 in *Circulation & Circ. Research* and 39 in *J. Physiology* (London).

Perhaps most enduring is the training and memories of shared scientific journeys with more than 95 coworkers and students that I have been honored to mentor, many of whom have had leading academic positions in USA, Europe and Asia. To name a few: J.N. Weiss, UCLA; Y. E. Goldman, U. Penn.; L. Tung, Johns Hopkins; G. Salama, U. Pittsburg; B. Knollmann, Vanderbilt; and JSK. Sham, Johns Hopkins; J. Suzuki, Georgetown University; T. Yanigasawa, Sendai, Japan; S. Adachi-Akahane, Tokyo Japan; S-H. Woo, Korea; A. Konnerth, Munich Germany; M-J. Su, Taipei Taiwan; S. Hatem, Paris France; L. Gandia, Madrid Spain.

My journey in science has ranged through many areas of biology. It began in 1966 at Physiologisches Institute directed by Professor Wolfgang Trautwein at Heidelberg University, Germany, where I developed a novel technique for voltage clamping intact cardiac muscle trabeculae that became known as the single-sucrose gap voltage clamp technique. This approach allowed me to examine the regulation of contraction by the action potential (*Pflugers Arch. Gen. Physiol.*, 1968), that led in turn to the discovery of calcium current. In 1968 I continued my postdoctoral training at the UCLA Heart Lab where I extended voltage-clamping mammalian heart tissues to frog heart, which exposed major differences in the regulation of contractility by membrane potential in the two hearts (*J. Physiol.* 1971)

Cardiac EC-coupling: I was first to show that cardiac action potential both triggers the release and regulates the entry of Ca^{2+} for contraction, and that this process is mediated in mammalian hearts by ICa gated Ca^{2+} -release from sarcoplasmic reticulum (*Science*, 1989). In

amphibian, shark, and reptilian hearts, on the other hand, where intracellular Ca^{2+} release stores are not well developed, Ca^{2+} influx via the Ca^{2+} channels and efflux via NCX mediate the contraction (*J. Physiol.* 1971). We were among the first to identify privileged communication between Ca^{2+} channels and RyRs in the dyadic junctions (*PNAS*, 1996), where ICa⁻-triggered Ca^{2+} release helped to inactivate Ca^{2+} channels (Ca^{2+} -dependent inactivation). Our rapid 2-D confocal imaging of local Ca^{2+} release loci showed activation of Ca^{2+} sparks originating from clusters of RyRs within the micro-domains of dyadic junctions (*PNAS*, 1998). We identified differences in spark frequency, size and kinetics between atrial and ventricular tissues. We identified the LA-domain (apo-calmodulin binding motif) of C-terminal Ca^{2+} channel to be responsible for the higher spark frequency of the peripherally located RyR2s in atrial myocytes. We were also among the first to use genetically engineered mice to probe the effects of overexpression of NCX, PLB, and CSQ on Ca^{2+} signaling, finding cardiac hypertrophy and failure only with CSQ overexpression (*J. Clinical Invest.* 1998). Such findings led us to recognize that the basic scheme of ICa-triggered release of Ca^{2+} from the sarcoplasmic reticulum shows considerable plasticity, especially during development and in pathological conditions, providing critical roles for IP₃ mediated Ca^{2+} release and mitochondrial Ca^{2+} signaling

Adrenergic regulation of the heart: I was first to identify that the relaxant effect of catecholamines on cardiac contraction was independent of its positive inotropic effect (*Science*, 1969). Since SR Ca^{2+} uptake machinery was poorly developed in some non-mammalian hearts without altering their adrenergic relaxant effects, the finding led us to probe the adrenergic relaxant mechanisms in non-mammalian vertebrate hearts, comparing differences between mammalian vs frog vs shark hearts as related to expression of PKA-regulation of Na^{+} - Ca^{2+} exchanger and relaxation (*PNAS*, 1996 & 2001). We concluded that evolutionary expression of cAMP regulatory motif on NCX was responsible for its adrenergic relaxant effects in these hearts and that the deletion of PKA-mediated phosphorylation motifs of NCX, in mammalian hearts, was a consequence of development of SERCA/PLB and Ca^{2+} release stores of their SR. We were first to clone the frog and shark heart isoforms of NCX and identify the molecular domains responsible for their unique regulation by cAMP (*American journal of physiology*, 2009)

Development of novel technologies: Throughout my career I have either developed or used novel approaches to

identify and characterize the Ca^{2+} signaling and electrophysiological properties of the heart. For instance, we were first to develop: 1) the single sucrose gap technique to study EC-coupling in ventricular strips (*Pflugers Archiv*, 1968) 2) ion-selective microelectrodes to show beat-to-beat accumulation and depletion of K^{+} in the extracellular space of myocardium as well as providing direct evidence for inward rectification of K^{+} channels (*Science*, 1976) and the adrenergic regulation of Na-K ATPase; 3) acousto-optically steered laser scanning system to map action potentials at hundreds of tissue sites in sub millisecond domain using fluorescent voltage-sensitive dyes (*Science*, 1976 & 1981) in order to map re-entrant arrhythmia in ventricular tissue; 4) photo-release technology to release caged Ca^{2+} or unblock photo-sensitive Ca^{2+} channel blockers to probe the role of Ca^{2+} channel in EC-coupling (*Nature*, 1983), and determine the kinetics of Ca^{2+} -dependent inactivation of the channel (*Science*, 1988); 5) use of genetically encoded Ca^{2+} sensitive probes targeted to proteins in Ca^{2+} signaling pathway (*Cell Calcium*, 2017); 6) and, most recently, the combined technology of applying CRISPR/Cas9 gene-editing of RyR2 in stem-cell derived human cardiomyocytes to probe the structure function of RyR2 and mechanism of CPVT1 (*Cell Calcium*, 2013 & 2018).

SA-nodal Pacemaker Mechanism: Our lab was first to show that If did not result from turn-off of a K^{+} current, but rather activation of a novel nonselective cation channel (*J. Physiol.* 1981). Further, we showed that diastolic depolarization continues and can be accelerated by adrenergic agonists in If-blocked rabbit SA-nodal cells (*Pflugers Archiv*, 1983). More recently we have provided evidence that Ca^{2+} -oscillations in embryonic myocytes, responsible for rhythmic spontaneous beating in developing rat neonatal or human iPSC-derived cardiomyocytes, occur in absence of If expression or following its block by Cs^{+} . (*Cell Calcium*, 2017) Ca^{2+} oscillations in developing cells appear to be regulated, by diversity of Ca^{2+} signaling of different populations of mitochondria and interaction between SR and mitochondria in their close proximity (*Can. J. Physiol. Pharmacology*, 2017).

Mitochondrial and hiPSC Ca^{2+} signaling: We were first to show that shear-stress induced Ca^{2+} -release from mitochondria is caused by a mechanism independent of CICR (*J. Physiol.* 2004). This work was followed by development of our new mitochondrial targeted genetic Ca^{2+} probes and a systematic investigation of the role mitochondrial Ca^{2+} signaling in EC-coupling and pacing.

In 2019/20 we published 4 peer reviewed papers on various aspects of hiPSC-CMs, examining their Ca^{2+} signaling phenotypes as compared to adult cardiomyocytes (*Cell Calcium*, 2020), reported on possible expression of neuronal channels and transcription factors during hiPSC-CMs maturation (*Stem Cells Dev.* 2019), and probed possible mechanisms of genetic induced pathologies of RyR2 that produce arrhythmias by gene editing (*Heart Rhythm*. 2020).

Over the years, the work described above was performed at several academic institutions, including the University of Pennsylvania (1970-1992), Georgetown University (1992-2008), and, since 2009 at the Cardiac Signaling Center established jointly by the University of South Carolina, MUSC, and Clemson University, where I was appointed as the inaugural director and an endowed Smart-State Chair in regenerative medicine. This opportunity along with its resources for research made it possible to apply my expertise in cardiac electrophysiology and calcium signaling to the newly developing fields of stem cell biology, genetic editing, and genetically encoded biosensors. My current research is focused on: 1) pinpointing the role of mitochondrial Ca^{2+} signaling in the generation of pacemaker activity in developing cardiomyocytes and in adult SA-nodal cells, toward the

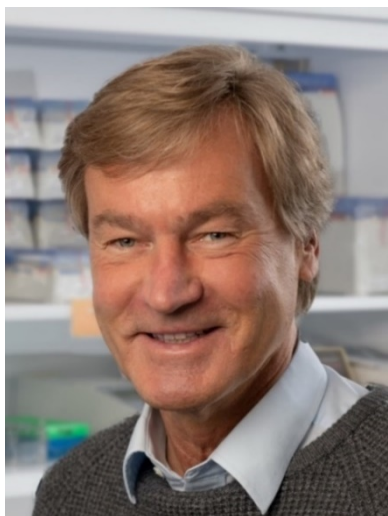
translational goal of identifying the “master oscillator” of the heart in order to engineer tissue-based pacemakers for therapeutic use, 2) examining genetically-induced Ca^{2+} signaling pathologies in cardiomyocytes of genetically engineered mice or in myocytes generated from fibroblasts of CPVT-patient’s, (hiPS-CM) with point mutations in RyR2 and 3) development of new fluorescent Ca^{2+} -sensing peptides that are targeted to different subcellular locations (mitochondria, RyR2, PLB & HCN4) to probe the nano-domains of Ca^{2+} signaling in neonatal and adult cardiomyocytes under control, and acute hypoxic conditions.

Throughout my career, ranging from my training years at Heidelberg University and UCLA, to my first faculty position at University of Pennsylvania, to Georgetown University, and continuing now in Charleston SC, I gratefully acknowledge the continuous funding of my Lab by NIH that allowed me the academic and scientific freedom to pursue out-of-box ideas that resulted in the scientific discoveries outlined above.

https://www.ncbi.nlm.nih.gov/sites/myncbi/martin.morad.1/bibliography/40495143/public/?sort=date&direction=d_ascending

Dr. Gerd Heusch as Translational Researcher for More than Four Decades

*Gerd Heusch, MD, PhD, FRCP
Director, Institute for Pathophysiology,
University of Essen Medical School, Essen, Germany*



Dr. Gerd Heusch

Gerd Heusch was born in Bonn, the then capital of Germany, in 1955. He was raised as the first of five children. Both his parents were classics teachers. So naturally he attended a traditional gymnasium with a focus on Latin and ancient Greek. He excelled in classics and at age 17 won a gold medal at the International Premio di Cultura in San Remo, Italy. Almost naturally, he also started his studies at the University of Bonn in classics, only to find out after one semester that this was not what he wanted to do for the rest of his life. After exploratory visits to several other faculties, he decided for medicine. He completed his preclinical studies at the University of Düsseldorf and his clinical studies at the University of Bonn. During medical school he developed an interest for cardiovascular medicine, notably the autonomic regulation of the cardiovascular system. His doctoral thesis, under the supervision by Prof. Dr. A.W. von Eiff, was on the impact of stress, notably traffic noise, on the blood pressure

responses of healthy and hypertensive humans – a topic of great interest much more today than in 1977, when he was co-author on the paper in the journal, which he has become editor of later (*Basic Res Cardiol* 72, 1977, 575-83). After his graduation and approbation as physician in 1979, he spent his year of obligatory military service as a physician captain.

In 1980 he started his formal scientific training as a research assistant in the Department of Physiology at the University of Düsseldorf. Here his interest focused on the sympathetic regulation of coronary blood flow. In collaboration with Andreas Deussen, they challenged the then prevailing paradigm that in ischemia coronary vessels are maximally dilated and they demonstrated in dogs that active alpha-adrenergic coronary vasoconstriction during sympathetic activation reduces coronary blood flow and contributes to myocardial ischemia (*Circ Res* 53, 1983, 8-15). This finding was provocative at the time, but Heusch and others have confirmed subsequently the impact of alpha-adrenergic coronary vasoconstriction in myocardial ischemia/reperfusion in a number of animal experiments and clinical studies over the years (*Circulation* 81, 1990, 1-13 and 101, 2000, 689-94). In 1985, Heusch completed his habilitation for physiology at the University of Düsseldorf under supervision by Prof. Dr. Volker Thämer.

He then moved with a scholarship from the German Research Foundation to spend 1½ years at the Seaweed Canyon Laboratory of the University of California, San Diego under the supervision of Dr. John Ross Jr. This time had a major impact on him, he says: “Dr. Ross was a modest, almost shy person, but he had the brightest brain I have ever seen. He knew everything about the heart. To me he was the impersonation of “fortiter in re, suaviter in modo” and the greatest mentor I could wish for.” In Seaweed, Heusch collaborated closely with Brian Guth, and together they performed a series of studies in chronically instrumented conscious dogs with exercise-induced myocardial ischemia to work out the underlying sympathetic mechanisms, notably tachycardia and alpha-adrenergic coronary vasoconstriction (*Circulation* 75, 1987, 482-90 and 661-9).

On his return to Germany, Heusch was awarded a Heisenberg scholarship by the German Research Foundation which he used 50:50 to continue his experimental work in the Department of Physiology and to receive clinical training in the Cardiology Clinic of the University Düsseldorf under Prof. Dr. Franz Loogen who was not only a most eminent clinical cardiologist but to Heusch also a great teacher and mentor.

In 1989, Heusch was appointed full professor and chair of the Institute for Pathophysiology in the Center of Internal Medicine at the University of Essen, a position which he holds since. In Essen, Heusch built a team of researchers and

clinician-scientists who developed dog and pig models of myocardial ischemia/reperfusion. Together with Rainer Schulz, they performed a large series of studies which characterized the functional, metabolic and structural features of stunned and hibernating myocardium (*Nature Rev Cardiol* doi 10.1038/s41569-021-00506-7). After 10 years at the University of Essen, Heusch retreated for a full year's sabbatical which he spent with Drs. Michael Cohen and James Downey at the Department of Physiology, University of South Alabama in Mobile. In a stimulating and fruitful atmosphere, Heusch became acquainted with many more details of the cardioprotective signal transduction of conditioning strategies. On his return to Germany, Heusch focused his research on cardioprotection, i.e. the reduction of myocardial ischemia/reperfusion injury in experimental and clinical studies – the focus of his research until today (*Nature Rev Cardiol* 17, 2020, 773-89). Numerous studies on the signal transduction of ischemic pre- and postconditioning were performed in various pig, rat and mouse models. Together with Rainer Schulz, Heusch identified several features and signal transduction steps, notably the causal role of connexin 43 and STAT 3 in ischemic pre- and postconditioning (*Circ Res* 116, 2015, 674-99).

In collaboration with his clinical colleague Prof. Dr. Raimund Erbel, Heusch performed a series of experimental and clinical studies on coronary microembolization and characterized its functional, metabolic, morphological and molecular features in the experiment and its footprint in imaging and biomarker modalities in patients with periprocedural microembolisation (*Circulation* 120, 2009, 1822-36). For about the last decade, Heusch focused his interest on remote ischemic conditioning and its clinical translation. Together with Petra Kleinbongard, they performed a series of experiments in a pig model of remote ischemic conditioning to identify the neuronal, humoral and intracardiac signal transduction of this cardioprotective strategy; they identified the spleen as an important relay organ (*Circ Res* 123, 2028, 1152-63). Importantly, in collaboration with his cardiosurgical and anaesthesiological colleagues, Heusch initiated and led a clinical trial in cardiosurgical patients and demonstrated protection by remote ischemic conditioning (*Lancet* 382, 2013, 597-604). Translational studies on the signal transduction and clinical translation of remote ischemic conditioning are still ongoing.

Throughout his professional career, Heusch has been productive. He is the author of more than 600 original or review articles and has a triple-digit h-factor in web of science. He is particularly proud on a number of excellent collaborators who trained with him over the years. His former collaborator Rainer Schulz is now professor and chair of the Physiology Department at the University Giessen, his former collaborator Bodo Levkau is now professor and chair of the Molecular Medicine Institute at

the University Düsseldorf, and his current collaborator and deputy chair Petra Kleinbongard is now professor of cardioprotection at the University Duisburg-Essen.

Heusch is editor of Basic Research in Cardiology since 1992 and has established the journal in the top rank of all cardiovascular journals. He has served or still serves on the editorial board of several prestigious journals, including Circulation, Circulation Research, Journal of the American College of Cardiology, European Heart Journal, Cardiovascular Research, American Journal of Physiology and others. Heusch has been actively involved in several professional societies. He has served as chairman of the Working Group on Myocardial Function of the European Society of Cardiology, as president of the European Section of the International Society for Heart Research and as president of the German Cardiac Society. He has also served as the speaker of the medical board of the German Research Foundation.

Heusch has received numerous awards. He holds an honour's doctorate of the Medical Academy Nishnij Novgorod/Russia and an honour's professorship of the

Tangshan Medical College/China. He is adjunct professor in the Department of Physiology at the University of South Alabama, Mobile. He was elected fellow of the Royal College of Physicians, London and a member of the Nordrhein-Westfalen Academy of Sciences and Arts where he serves as speaker of the medical section. Heusch has delivered the Basic Science Lecture and the William Harvey Lecture of the European Society of Cardiology, received the Keith Reimer award of the International Society for Heart Research, the Carl Wiggers award of the American Physiological Society, and the Carl Ludwig honour's medal of the German Cardiac Society. In the public domain, he was awarded the cross of merit by the Federal Republic of Germany and also by his home state Nordrhein-Westfalen for his fundamental research and fight against myocardial infarction.

Off work, Heusch is a recreational runner and an avid reader of mostly history books. Heusch and his wife Beate are proud of their 3 children and (so far) 2 grandchildren.

Professional Journey of Dr. Grant Pierce

*Grant N. Pierce, OM, PhD, FIACS, FISHR, FAHA, FACC, FCAHS, FRSM (London), FRSC
President-Elect, International Academy of Cardiovascular Sciences,
Distinguished Professor, University of Manitoba, Winnipeg, Canada*



Dr. Grant Pierce with his Research Team

I have a rather macabre apprehension as I undertake the endeavour of describing my professional career. That's because, any way you want to look at it, writing about your scientific career acknowledges that that career is nearing its end. This becomes, therefore, a kind of scientific obituary.

I have often said to my students that what they will remember through the years are the people, the experiences and the fun they had in science, much more than the papers they published. After all, no matter how important the paper is at the time of publication, its significance is bound to wane and may even become lost as time moves on.

However, the people you meet along your scientific journey and the impact they have on your life in so many different ways, stays. I shall follow my own advice in this discourse then and focus upon the people who have had a major impact upon me during my scientific career instead of advances which may or may not have been significant.

I'll start with the most important person who has had an impact upon my scientific career: my wife Gail. I actually started my graduate work at the University of Windsor in Canada and lasted a whole three weeks before returning to her hometown to be with her. My career aspirations were irrelevant compared to my life with Gail. Throughout our lives together, nearly 50 years, she has been my advisor, my confidante, my greatest supporter, at times my psychiatrist, and always my constant companion and love. To overestimate the impact she has had on my scientific career would not be possible. We began our journey with my graduate studies at Dalhousie University in Halifax, Canada. My supervisors there, Drs Arend Bonen and Angelo Belcastro, introduced me to their infectious enthusiasm for science and the fun and companionship inherent in the pursuit. They taught me that there is no replacement for hard work and long hours in the lab and I am eternally grateful for those lessons. Truly, it never felt like hard work and the hours and years flew by. My PhD studies were carried out under the tutelage of Dr Naranjan Dhalla in Winnipeg, Canada and again, this represented another step up in my learning process. It was the research environment he provided that was special. I worked alongside many other students who all became close friends and who ultimately became successful independent researchers of their own. Drs Larry Fliegel, Clayton Heyliger, Morris Karmazyn, Michael Kutryk, Marni Moffat and Balwant Tuana were all together in this scientific crucible of interactions and discovery and fun. All became wonderful role models, close friends and advisors to me in their own right during my career. Dr Dhalla provided me with an unending supply of encouragement, support and a family atmosphere that has continued to the present day. Without this support, I could never have achieved anywhere near what I did. The other faculty members at the time were an integral part of that family and the support structure that every young trainee must possess. Drs Pawan Singal and Vincenzo Panagia were key players in that role for decades and Dr Singal continues to be a close friend and colleague.

My Postdoctoral training at UCLA became the third major rung on my ladder of scientific learning. Dr. Glenn Langer headed the group at UCLA and was the epitome of the gentleman and scholar, a man of integrity and character, very intelligent but ready to smile and joke too. My primary advisor at UCLA day-to-day, however, was Dr Ken Philipson. Ken is a brilliant scientist, a tough task master and competitor who had a curious elvish fun-loving way

about him that made my training period in Los Angeles and the life Gail and I experienced while there special and memorable. If anyone taught me about scientific process in the lab, it was Ken and I am ever grateful for the patience he showed me and the lessons I learned that were critical for me to have the confidence to establish my own independent career, which I did in 1986 back in Winnipeg at the University of Manitoba. It is there that I have remained as a faculty member throughout my career. I would be remiss if I did not mention Dr Henry Friesen who also had an important impact on my career. As Department Chair then, he, of course, was ultimately responsible for being the first to hire me into this wonderful life in medical science. His nurturing of my career later while he was leading the Medical Research Council of Canada was critical to provide me with opportunities to contribute to peer review processes and scientific discovery across Canada which I would never have had if it were not for his quiet input. He remained an important force throughout my term as Executive Director of Research at St Boniface Hospital. He was always supportive, always there with sage advice whenever necessary. Similarly, I am ever grateful to Dr Bram Ramjiawan who provided me with critical support in both clinical research and business issues during my tenure at the Hospital. He is an unusually humble man with no reason to be so modest when his expertise is internationally recognized and irreplaceable. Some of the most influential figures in my scientific career were without a doubt also those who worked in my lab. The long time technicians and senior fellows who provided too many hours of work - Thane Maddaford, Alex Austria and Dr Elena Dibrov, and the many students who contributed tirelessly and continually infected the lab with energy and laughter. Thank you all!

It is my fervent hope, as I am certain it is with all scientists, that our research contributions were valuable and provided significant advancements in our fields of study. I believe we made seminal contributions in identifying a diabetic cardiomyopathy (when no one believed it existed) and establishing its subcellular basis, we defined characteristics of the regulation of Ca^{2+} transport in the heart, we were at the earliest days of identifying a critical role for the Na/H & Na/Ca exchange pathways in myocardial ischemic/reperfusion injury (that is now the accepted mechanism for myocardial injury and cell death), before we discovered the impressive preventive effect of dietary supplementation with flaxseed on hypertension, arrhythmias, atherogenesis and myocardial infarctions. We were the first to identify a causal link for a bacterial infection with cardiovascular disease which ultimately led to what may be our most exciting and clinically relevant line of investigation – the finding with Dr Pavel Dibrov of a novel platform of antibiotics (the first in over 40 years) to combat the coming danger of bacterial multidrug resistance that threatens to transform current medical

practice if left unaddressed. It should be obvious from the disparate nature of these research fields that I was unafraid to change fields, in many cases quite drastically. We moved from cell to molecular to whole body, from basic science and animal studies to the lead in major clinical trials. It continually made scientific discovery in our lab risky but fresh and exciting. That is the way, in my mind, science should be: always intellectually challenging and continually enjoyable. It has been a pleasure and an honour to have had this opportunity through the past six decades from the 1970s into the 2020s! I am humbly grateful to all who have made this possible.

Ten selected papers from the research career of Dr G.N. Pierce

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vascular smooth muscle cells is mediated by the MAP kinase ERK2. *J. Cell Biol.*, 148: 7-15, 2000.

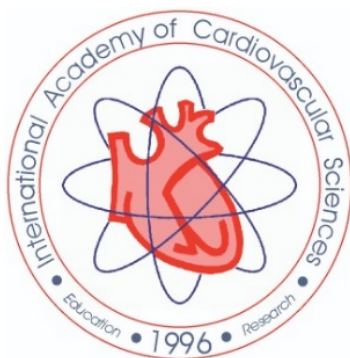
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Rodriguez-Leyva, D., Weighell, W., Edel, A.L., La Vallee, R., Dibrov, E., Pinneker, R., Maddaford, T.G., Ramjiawan, B., Aliani, M., Guzman, R. and Pierce, G.N. Potent anti-hypertensive action of dietary flaxseed in hypertensive patients. *Hypertension*, 62:1081-1089, 2013.

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Professional Journey of Dr. Balwant Tuana

Balwant Tuana, PhD

*Professor, Department of Cellular and Molecular Medicine, Faculty of Medicine,
University of Ottawa, Ontario, Canada*



Dr. Balwant Tuana

Dr Balwant Tuana PhD, is a Professor in the Department of Cellular and Molecular Medicine, Faculty of Medicine, University of Ottawa, Ontario, Canada. Dr Tuana grew up in England and graduated with a BSc (Hons) degree in Biochemistry from the University of Liverpool with research guidance from the late Dr James Haslam working on mitochondria. Dr Tuana then moved to the Department of Physiology headed by Dr Henry Friesen and carried out his Doctoral studies in the Laboratory of Professor Naranjan Dhalla in the field of cardiovascular pathophysiology, with a focus on membrane biology. Dr Tuana's postdoctoral training was carried out in the laboratory of the late Professor David MacLennan in the field of muscle biology at the Charles Best Institute, University of Toronto. Dr Tuana was then recruited as Assistant Professor in the Department of Pharmacology at the University of Toronto, headed by the late Dr Phillip Seeman. Dr Jose-Maria Trifiro, Chair of the Pharmacology Department at the University of Ottawa, recruited Professor Tuana where he became the founding Director of the Graduate Program in Pharmacology and facilitated its successful evolution into the graduate program in Cellular and Molecular Medicine encompassing Physiology, Anatomy and Neurobiology that he currently directs.

While Dr Tuana has been very active in developing and teaching courses at the undergraduate and graduate level in the Faculty of Medicine, he has also developed a vibrant research program in discovery science. His laboratory first identified, named and characterized the SLMAP gene. SLMAP encodes proteins that belongs to the superfamily of tail anchored membrane proteins and is also a core component of the mitotic organizing center of the cell. SLMAP is part of the STRIPAK complex which regulates the HIPPO pathway critically regulating cell growth/death and differentiation. SLMAP is linked to human disease including Brugada, cancer, diabetes, and Dr Tuana's lab has generated tissue specific, in vivo gain/loss of function models to investigate with precision the diverse roles of the SLMAPs. Dr Tuana also first discovered E2F6, a transcriptional regulator in an interaction screen with SLMAP. Using in vivo modeling, his group discovered unique roles for E2F6 and the E2F pathway in dilated cardiomyopathy. Studies are in progress to interrogate E2F6 modulation as a potential new therapeutic target in idiopathic DCM. Dr Tuana's group also first identified the muscle specific isoform of the beta CaMKinase (CaMKIIb4) which plays a critical role in the normal function of myocardium. In vivo models and studies are in progress deciphering the role of this unique kinase in cardiac biology. Dr Tuana has documented his discoveries in over 60 publications which have spawned research efforts in many labs and fields.

Dr Tuana has won many awards and has been supported by Scholarships at every level starting with a Doctoral Traineeship from the Heart and Stroke Foundation, Postdoctoral Fellowship from the Muscular Dystrophy Association, Scholarship from the HSF of Ontario, and the Career Investigator Award from HSFO. Dr Tuana has been consistently funded through peer review grants from HSFC, CIHR and MDA for his innovative research programs.

Dr Tuana has mentored more than 100 trainees at various levels, and many are now leaders in academia, health fields and industry.

Dr Tuana has been very active in the peer review system with developing process, reviewing scholarships and grants and serving as Deputy Chair or Chair of grant panels at the CIHR and HSFC. He also served as Chair of National Peer Review Committee of the HSFC. He also serves on editorial board of several international journals and reviewer for many biomedical journals

Some selected papers of Dr. Balwant Tuana

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expression in myocardium resulting in dilated cardiomyopathy. *FASEB J*. 26; 2569-79. 2012

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Major JL, Salih, M. Tuana BS. E2F6 Protein Levels Modulate Drug Induced Apoptosis in Cardiomyocytes. *Cell Signal* 1:117-124, 2017

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Dr. Enrique Castaneda Appointed as Chancellor Cayetano Heredia University, Peru

*Enrique Castaneda, MD, PhD, FIACS
Chancellor, Cayetano Heredia University
Lima, Peru*



Dr. Enrique Castaneda

Graduated in Medicine at Universidad Nacional de Trujillo, Peru, he completed the residency in General Surgery and also the specialty of Thorax and Cardiovascular Surgery, as well as the degrees of Master of Medicine and Doctor of Medicine at Universidad Peruana Cayetano Heredia. He was a fellow and disciple of Professor Enio Buffolo at the Escola Paulista de Medicina, Sao Paulo - Brazil, as well as Professor Agustín Arbulú at Detroit Medical Center - affiliated with Wayne State University. He became a Professor at the Universidad Peruana Cayetano Heredia, and also completed the specialty of Health Administration and the Master's Degree in Public Health with a mention in Management and Government.

Upon his return from Brazil at the beginning of 1994, he reorganized the Thoracic and Cardiovascular Surgery service of the Cayetano Heredia Hospital, giving a boost to the development of cardiac surgery, thanks to the support

of his mentors Dr. Buffolo and Dr. Arbulú. He has contributed to the training of various classes of thoracic and cardiovascular surgeons.

Dr. Castañeda has distinguished himself for his leadership and commitment in promoting research and disseminating new knowledge. He has been a founder and president of the Peruvian Society of Cardiac, Thoracic and Vascular Surgery, from where he organized several international conferences. He is a member of several scientific organizations, standing out as a Fellow of the International Academy of Cardiovascular Sciences since 2013. He is also a member of the Peruvian Academy of Surgery; the Peruvian Society of Health Administration, and the Latin American Society of Cardiovascular and Thoracic Surgery, among other.

In university management, he has held the positions of Director of the Planning, Management and Administration Division of the School of Medicine; Head of the Administrative Unit of the Joint Schools of Medicine, Stomatology and Nursing; and Project Manager of the CREO Renal and Oncological Clinic at the University. He has also coordinated the training of specialists in health administration, who stand out in the management of public and private institutions.

He has published a book and 21 peer-reviewed publications. He has been a lecturer at multiple scientific events.

Dr. Castañeda has been elected to serve as Chancellor of Universidad Peruana Cayetano Heredia, for the period 2021-2026.



Academy Pays a High Tribute to Professor Edward Carmeliet Founder of Cardiac Electrophysiology



*Dr. Edward Carmeliet
1930 - 2021*

It is with great sadness that we mourn the passing of Prof. Edward Carmeliet, one of the founders of the Working Group on Cardiac and Cellular Electrophysiology (WGCCE) and a mentor, colleague and dear friend to many WG members. Prof. Carmeliet is considered one of the fathers of cardiac cellular electrophysiology.

From his first publication in 1957 on ventricular action potentials to his last publication in 2019 on cardiac pacemaking, he contributed more than 300 publications and made seminal contributions to the field. He trained and mentored innumerable cellular electrophysiologists and was one of the giants on whose shoulders many great scientists have built.

Prof. Carmeliet created the WGCCE together with his friend Prof. Edouard Coraboeuf with the aim of bringing together basic cardiac electrophysiologist researchers to share scientific information in a friendly atmosphere and to allow young Ph.D. trainees to present their work to an international audience.

The first meeting was held in Leuven, Belgium, in 1977, gathering about 100 scientists investigating the cardiac action potential and the underlying ionic currents. Shortly after, Prof. Silvio Weidmann joined them in this effort. Our WG still continues in the spirit in which it was created, and the legacy of the WG founders is commemorated with the Carmeliet-Coraboeuf-Weidmann lecture presented at the annual meeting. Prof. Carmeliet continued to support the WG

throughout his life and attended many WG meetings. He also provided the first WG webinar on “Cardiac cellular electrophysiology: back to basics” in January 2020, which was viewed by more than 700 scientists from around the world.

In addition to being an outstanding scientist, Prof. Carmeliet will be remembered for his enjoyment of sharing his knowledge and interacting with younger scientists, and his kindness towards all. He has inspired many generations of electrophysiologists and will remain alive in our collective memory.

Obituary published with permission from the European Society of Cardiology: Authors: the ESC Working Group on Cardiac Cellular Electrophysiology: link to the full obituary: <https://www.escardio.org/Working-groups/Working-Group-on-Cardiac-Cellular-Electrophysiology/News/Edward-Carmeliet-4-January-1930-5-April-2021>

Some Highlights of the Professional Journey of Dr. Edward Carmeliet

Dr. Edward Emiel Carmeliet received his M.D. degree in 1955 from the University of Leuven and completed his Ph.D. in 1961. From 1958-1961, Dr. Carmeliet was a Visiting Scientist at the University of Bern, Switzerland with Drs. S. Weidmann and A. von Muralt in the Laboratory of Physiology. He was also a Visiting Professor at Duke University North Carolina in 1972 to 1973. From 1967-1995, Dr. Carmeliet was Full Professor, University of Leuven and became Professor Emeritus at University of Leuven in 1995. He was the recipient of an Honorary Doctorate in 1999 from the University of Bern.

Dr. Carmeliet has been the recipient of several awards including the Laureate Wedstrijd voor Reisbeurzen of the Belgian Government (1956), the Laureate J.B. van Helmont of the Royal Academy of Medicine (Belgium), Binnenlandse Francqui-leerstoel (Chair Francqui) from the University of Gent (1977-1978) and the Prof. Pierre Rijlant Prize in Cardiac Electrophysiology in 1991. Dr. Carmeliet was a member of several prestigious organizations including the Belgian Society of Cardiologists, British Physiological Society, American Society of General Physiologists, European Society of Cardiology, ISHR and the AHA (Fellow Basic Science Council). He also served on the Editorial Boards of several notable and highly ranked peer review journals including, Circulation Research and British Journal of Pharmacology. Of note, Dr. Carmeliet served as Consulting Editor (1990-1998) for the Journal of Cardiovascular Pharmacology and Associate Editor (1987) of Journal of Molecular and Cellular Cardiology.

Professional Achievements of IACS Council Members

While celebrating 25th Anniversary, Dr. Roberto Bolli, President of IACS, wishes to thank all IACS Officers and Council Members as well as IACS-Section Officers for their efforts and dedication to the mission of the Academy for preventing heart disease. Debt of gratitude is also due to their services for maintaining high ethical and moral standards in selecting various Awards and Fellowship Recipients to promote excellence in Cardiovascular research and education. It is intended to acquaint the cardiovascular community with the accomplishments of all these individuals (a few at a time) during this special year.

Professional Achievements of Dr. Jawahar (Jay) Mehta

*Jawahar Mehta, MD, PhD
Distinguished Professor of Medicine and Physiology & Cell Biology,
University of Arkansas for Medical Sciences,
Little Rock, Arkansas, USA*



Dr. Jawahar Mehta

Dr. Mehta received his MD degree from Panjab University, India (Summa cum laude) and PhD in University of Uppsala, Uppsala, Sweden, and completed his post-graduate education in Mount Sinai School of Medicine, New York, NY and University of Minnesota, Minneapolis, MN. Following his training, he joined the faculty of the

University of Florida College of Medicine, Gainesville, FL where he rose to be University Research Foundation professor

He moved to Little Rock, Arkansas in 2000 as the first *Stebbins Chair in Cardiology and Professor of Medicine and Physiology and Biophysics*. He led the Division of Cardiovascular Medicine at the University of Arkansas for Medical Sciences and the affiliated Central Arkansas Veterans Affairs Medical Center.

Dr. Mehta is known for his original work on platelet biology and thrombosis in myocardial ischemia in late 1970s and early 1980s. This seminal work led to the trials of aspirin and other anti-platelet drugs in cardiac patients.

Dr. Mehta's research has focused over the last 20 years on the biology of LOX-1, a receptor for oxidized low density lipoprotein, which has opened a new target for cardiovascular therapy. His recent work has led to the development of small molecules targeting LOX-1, and development of biologics by major pharmaceutical companies Amgen and MedImmune. His work has been

supported the NIH, AHA and the Department of Veterans Affairs, and several pharmaceutical companies-continuously for the last 36 years. In 2020, he was named a Senior Clinician-Scientist of the Department of Veterans Affairs.

Prof. Mehta serves or has served on the editorial boards of several major cardiology, physiology and pharmacology journals, including *Circulation*, *Hypertension*, *American Journal of Cardiology*, *European Heart Journal*, *Journal of the American College of Cardiology*, and the *World Journal of Cardiology*.

He has published over 1300 papers, abstracts and book chapters. He has published 7 books and has 11 patents.

He is a member of many prestigious academic societies, including the *Association of American Physicians*, *American Society for Clinical Investigation* and *Association of University Cardiologists*.

Grateful patients have established *Mehta Chair in Cardiovascular Research at UAMS* in his honor. Recently, *Jay and Paulette Mehta Lectureship in Internal Medicine* was established in their honor.

Dr. Mehta has lectured in over 30 countries. He is an honorary professor in the University of Rome, an adjunct Professor in the Clinton School of Public School in Little Rock, AR, and serves as consultant to the University of Arkansas in nanotechnology and biomedical engineering. Many of his trainees occupy positions of prominence in many countries, including China, India, Italy and Japan.

His h-index as of June 15, 2021 as per Google scholar is 110, with 129090 citations and i10-index of 597, which places him among the top <0.01% of all clinician-scientistsworld-wide

https://scholar.google.com/citations?user=d0XP_y8AAA&hl=en.

Recent major awards include, the *Pericle d'Oro International Prize* from the Magna Graecia University, Catanzaro, Italy in May 2014; the *UAMS Dean's Distinguished Faculty Scholar Award* in October 2015, *Albert Nelson Marquis Lifetime Achievement Award* in 2018. In July 2018, he was named *Distinguished Professor* by the University of Arkansas for Medical Sciences, and *Distinguished Professor* by the Anhui University, China in October 2018. In September 2019, he was awarded *Lifetime Achievement Award* by the International Academy of Cardiovascular Sciences in Serbia.

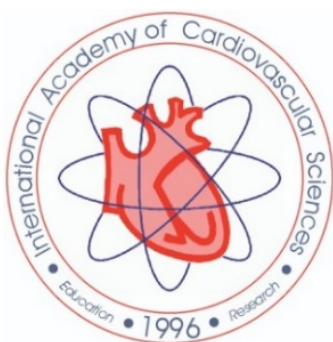
In December 2015, he was invited to the Nobel award ceremonies in Stockholm, Sweden as a special guest.

He is listed in *Marquis Who's Who in America*, *Who's Who in the World*, *Who's Who Medicine and Healthcare*, and *Leading Physicians of the World*.

As a testament to his clinical skills, Prof. Mehta was named among the *top 27 cardiologists in the United States* by *Forbes* magazine

<https://www.forbes.com/sites/matthewherper/2017/12/05/27-top-cardiologists-picked-by-big-data/#6b2b4d2b6a7e>.

He has been frequently listed among the *Top Doctors* in the US, and the *Best Doctors* in Arkansas



Professional Achievements of Dr. Karl Werdan

Karl Werdan, MD
*Professor of Internal Medicine and Cardiology,
Department of Medicine III Martin-Luther-University Halle-Wittenberg,
Halle (Saale), Germany*



Dr. Karl Werdan

Karl Werdan graduated in medicine at the University of Munich in 1973 and finished his medical doctor's thesis in the Department of Physiological Chemistry and Physical Biochemistry headed by Martin Klingenberg in 1975. He received specialist training in internal medicine, cardiology and medical intensive care at the University of Munich. In 1995, he took the Chair of the Department of Cardiac Intensive Care at Martin-Luther-University Halle-Wittenberg, 1999-2014 he was Director of the Department of Medicine III (Cardiology, Angiology, Medical Intensive Care Medicine, Geriatrics) and from 2006-2014 Executive Director of the Department of Medicine of the University Hospital Halle (Saale) of the Martin-Luther-University Halle-Wittenberg. In 1999 he was elected as member of the "Deutsche Akademie der Naturforscher Leopoldina" (German Academy of Scientists Leopoldina).

He was President (2001-2004) and Congress President (2001) of the German Society of Medical Intensive Care and Emergency Medicine and Congress President of the German Society of Cardiology in 2005. From 2007-2014 he was a member of the Scientific Advisory Board of the German Federal Physician Chamber (Responsibility: Cardiology/Intensive Care Medicine). Since 2012 he is a Honorary Member of the German Society of Medical Intensive Care and Emergency Medicine (DGIIN).

He received awards for outstanding merits of the German Cardiac Society, the German Heart Foundation, the International Academy of Cardiovascular Sciences (see below) and the German Society of Internal Medicine.

Karl Werdan has contributed scientific research in the fields of acute heart failure, heart diseases in the elderly, cardiac gerontology, inflammation in heart failure, cardiogenic shock and cardiovascular dysfunction in sepsis ("septic cardiomyopathy"). Publications include papers in the New England Journal of Medicine, The Lancet, Nature, Nature Genetics, Nature Reviews Cardiology, JAMA, European Heart Journal, J Physiology, Am J Physiol, Shock and JACC.

Karl Werdan has a longstanding affiliation with the IACS. In 2009 he was appointed President of the European Section of the International Academy of Cardiovascular Sciences till 2014. In September 2013, the meeting "Stress and Aging" was organized at the Martin-Luther-University in Halle (Saale), Germany, in collaboration with the International Academy of Cardiovascular Sciences. In 2013, Karl Werdan received the Distinguished Leadership/Lifetime Achievement Award in Cardiovascular Sciences 2013 of the International Academy of Cardiovascular Sciences. He has published more than 800 publications (including 6 books), h-Index 64, Sum of Times Cited 21,004; Citing Articles 15,891.

Selected publications

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Fu H, Alabdullah M, Großmann J, Spieler F, Abdosh R, Lutz V, Kalies K, Knöpp K, Rieckmann M, Koch S, Noutsias M, Pilowski C, Dutzmann J, Sedding D, Hüttelmaier S, Umezawa K, Werdan K, Loppnow H. The different statin effect on cytokine production of monocytes or macrophages is mediated by differential geranylgeranylation—dependent Rac1 activation. *Cell Death Dis* 2019;10(12):880.

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Professional Achievements of Dr. Dragan Djuric

Dragan Djuric, MD, PhD, FIACS

Professor of Physiology, Institute of Medical Physiology “Richard Burian”

Faculty of Medicine, University of Belgrade

Belgrade, Serbia



Dr. Dragan Djuric

Dragan M. Djuric (born in 1961 in the town of Krusevac, Serbia) received MD degree in 1987, MS degree in 1991, PhD degree in 1993, and Board certified in Clinical Physiology in 2007, all from the Faculty of Medicine University of Belgrade.

ACADEMIC POSITIONS AND ACHIEVEMENTS: Research Trainee (1986-1989), Research Assistant (1989-1991), Assistant (1991-1994), Assistant Professor (1994-1999), Associate Professor (1999-2008), Full Professor of Medical Physiology, (2008-present), all positions from the Faculty of Medicine, University of Belgrade; Head,

Laboratory for Atherosclerosis and Vascular Biology, Dedinje Cardiovascular Institute, Belgrade (1996-2000), Chair and Director, Institute of Medical Physiology, Faculty of Medicine, University of Belgrade (2006-2012), Founder and Chair, PhD Program in Physiological Sciences, Faculty of Medicine, University of Belgrade (2009-present), Adjunct Professor, Faculty of Pharmacy, University of Belgrade (1996-1997), Visiting Professor, Faculty of Medicine, University of Banja Luka (Bosnia and Herzegovina, since 2019), Adjunct Professor, Faculty of Medical Sciences, University of Kragujevac (since 2018). He supervised/co-supervised research of undergraduates (18), undergraduate thesis (1), MSc theses (9), and PhD dissertations (10). He was member of undergraduate thesis committee (4), MSc thesis committee (29), PhD dissertation committee (52), and member of committees for various academic and research titles evaluation (37). He was a foreign member of DSc dissertation committee (Slovakia), proposer for two positions of full professorship in the field of pathophysiology (Romania), and proposer for prestigious fellowships in Germany, Sweden, Canada and USA.

POSTDOCTORAL TRAINING: He obtained postdoctoral training in Germany (Max Planck Institute for Physiological and Clinical Research and Kerckhoff Klinik GmbH, Bad Nauheim, 1998, 2001-2002), and USA (Department of Physiology, College of Medicine, University of South Alabama, Mobile, 2000).

PROFESSIONAL POSITIONS: He co-founded the Yugoslav Atherosclerosis Society, than he was Secretary General (1998-2002). He founded Serbian Association for Arteriosclerosis, Thrombosis and Vascular Biology Research, than he was a President (2003-present). He was a President of the Executive Committee and Assembly of the Serbian Physiological Society (2006-2013, 2018-2021), and President of the Program and Nominating Committee (2013-2017). Dr. Djuric also had a lot of international responsibilities: 2000-present, National Representative, International Atherosclerosis Society, 2003-2013 Council Member, Federation of European Physiological Societies (FEPS), 2005-2009 Council Member, International Union of Physiological Sciences (IUPS), 2006-2014 Council Member, International Society for Pathophysiology, 2011-present, Member, Steering Committee, Global Network for Global Fight Against Cardiovascular Diseases, International Academy of Cardiovascular Sciences (IACS), 2015-present, Council Member, European Section, International Academy of Cardiovascular Sciences, and 2018-present, Executive Council Member, International Academy of Cardiovascular Sciences. He served as a member of Homocysteine Expert Panel (Germany, 2012), member of the International Lipid Expert Panel (ILEP, 2015-present),

and member of Lipid and Blood Pressure Meta-Analysis Collaboration (LBPMC) Group (2017-present).

ORGANIZATIONAL ACTIVITIES: He organized/co-organized numerous scientific meetings in Serbia: the first Yugoslav congress on atherosclerosis (Belgrade, 2001), satellite symposium of XIV International Symposium on Atherosclerosis (IAS Belgrade, 2006), international conference on nutrition and cardiovascular health (Novi Sad, 2007), 2nd European Section Meeting of the International Academy of Cardiovascular Sciences (Belgrade, 2015), and jointly held 6th Meeting of European Section and 7th Meeting of North American Section of the International Academy of Cardiovascular Sciences (IACS) (Vrnjacka Banja, 2019). He also organized/co-organized 4 congresses of physiological sciences (2005, 2009, 2014, 2018, respectively) as well as 8 conferences and meetings of physiological sciences with international participation in Serbia (2003, 2004, 2008, 2011) including jointly held Serbian-Slovak (2013, 2016, 2019) and Serbian-Hungarian bilateral physiological meetings (2017). He served many times as a co-chair of the sessions at different meetings; at FEPS congresses (Bratislava 2007, Budapest 2014); he organized thematic symposia on nitric oxide and cardiovascular regulation (FEPS Bratislava 2007), and co-organized the symposium on nutrition, cardiovascular health and new perspectives in prevention and therapy (FEPS Budapest 2014). He served as a member of the scientific/organizing committee at the international conference entitled “Advances and Controversies in B-Vitamins and Choline” (Leipzig, Germany, 2012), a few times at congresses of the International Atherosclerosis Societies (IAS), and as a member of the organizing committee of the FFC's 26th International Conference on “Functional Foods, Bioactive Compounds and Nutraceuticals in Health and Disease” (San Diego, USA, 2019).

RESEARCH ACTIVITIES: Up to the end of June 2021 Dr. Djuric published 787 different types of publications with 253 full-length papers (141 in peer-reviewed journals indexed in Clarivate Analytics/Web of Science) as well as 25 chapters in books/monographs; he wrote or edited 4 monographs, and edited/co-edited 14 books of abstracts from scientific congresses/conferences. He was cited more than 2000 times, and he presented invited talks 79 times in Serbia as well as 44 times abroad at institutions and conferences. He was principal investigator in national-funded grants in Serbia (since 2005), and he participated as a member of the managing committees of the COST Action [CA18216] “Network for Research in Vascular Aging (VascAgeNet, 2019-2023)”, COST action [CA16225 RS] “Realising the therapeutic potential of novel cardioprotective therapies (EUCARDIOPROTECTION, 2017-2021)”, and COST action [BM1005 Biomedicine and Molecular Biosciences] “Gasotransmitters: from basic

science to therapeutic applications (MC, ENOG: European Network on Gasotransmitters, 2011-2015).

EDITORIAL AND REVIEWER'S ACTIVITIES: He was reviewer many times in international and domestic scientific journals, and also served on editorial boards of the following journals: Canadian Journal of Physiology and Pharmacology (Associate Editor), Molecular and Cellular Biochemistry, Acta Physiologica Hungarica, Experimental and Clinical Cardiology, Pathophysiology, Mediterranean Journal of Nutrition and Metabolism, Medical Science Monitor Basic Research, Current Research: Cardiology, Archives of Medical Sciences - Atherosclerosis Diseases (Section Editor), Reviews in Cardiovascular Medicine (IMR Press), Yugoslavica Physiologica et Pharmacologica Acta, Serbian Journal for Experimental and Clinical Research, and Scripta Medica (Banja Luka); he was a member of editorial board of CV Network (global bulletin of the International Academy of Cardiovascular Sciences) (2007-2015). He served as guest editor or co-editor in special issues of international journals: Acta Physiologica Hungarica (2006), Canadian Journal of Physiology and Pharmacology (2008, 2016, 2019 a, 2019 b, 2020, 2021), General Physiology and Biophysics (2009), Medicinal Chemistry (2012), Current Medicinal Chemistry (2018), Oxidative Medicine and Cellular Longevity (2019), and Frontiers in Physiology (2021). He has been invited as a reviewer for book's proposals (international publishers: Springer Nature and Elsevier). He was abstract grader at large international meetings, and reviewer on grant's proposals (Serbia, Poland, Slovakia, Hungary, Canada).

AWARDS: Professor Dragan M. Djuric was elected as a Fellow of the International Academy of Cardiovascular Sciences (FIACS, 2011). He has been awarded with Distinguished Leadership Award in Cardiovascular Sciences, International Academy of Cardiovascular Sciences (2019), Andras Varro Award for Excellence in Cardiovascular Sciences (2018), Serbian Physiological Society Award for Lifetime Achievement in Physiological Sciences (2016), Lifetime Achievement Award in Cardiovascular Science, Medicine and Surgery by the International Academy of Cardiovascular Sciences (2015), Samuel Racz Medal and Honorary Member for the Contribution in Physiology from the Hungarian Physiological Society (2010), Honorary Member of the Bulgarian Society for Cell Biology (2009), Honorary Member of the Romanian Society for Laboratory Medicine (2008), Medal of the Yugoslav Society of Cardiology (2002), and Belgrade City October Award (1987). He was also awarded as the best session organizer at the FFC's 26th International Conference and Expo - 14th International Symposium of ASFFBC "Functional Foods, Bioactive Compounds and Nutraceuticals in Health and Disease" (2019, San Diego, USA).

SCIENTIFIC INTEREST: His scientific interest includes cardiovascular research, experimental cardiovascular models, endothelial dysfunction, homocysteine and related vitamins, gasotransmitters and oxidative stress, nutraceuticals and cardiovascular protection.

Professional Achievements of Dr. Ajit Mullasari

Ajit Mullasari, MBBS, MD, DM(Cardiology)
Director of Cardiology, Institute of Cardio-Vascular Diseases,
Madras Medical Mission, Chennai, India



Dr. Ajit Mullasari

I, Dr. Mullasari Ajit Sankardas, am currently holding the position of Director of Cardiology at the Institute of Cardio-Vascular Diseases, Madras Medical Mission, Chennai, India (www.mmm.org.in). After graduating in 1983 from the Grant Medical College, University of Mumbai, I did my Masters in Medicine and Post Doctoral Degree in Cardiology from the same University in 1991. I completed my National Board examinations in Cardiology in the same year. Subsequently I completed a Fellowship in Interventional Cardiology from The Prince Charles Hospital, Brisbane, Australia. I was awarded a Fellowship of the Royal College of Physicians, Glasgow in 2010 and

also a Fellowship of the International Academy of Cardiovascular Sciences in 2016.

During my undergraduate career, I was a recipient of the Glaxo Medical Education Award for the highest marks in Medicine at 3rd MBBS examination. In 1992, I was nominated for the Commonwealth Scholarship by the Government of India. I was also selected as the Rotary Foundation International Ambassadorial Scholar for 1993 – 1994. During the Euro Paris Revascularisation Interventional Course in 2001, my presentation “Transcatheter closure of post Myocardial Infarction Ventricular Septal Defect with Amplatzer Septal Occluder” was adjudged the best interventional case. I was awarded the 9th Prof. Rathinavelu Subramaniam Memorial Oration Award instituted by the Association of Physicians of India in August 2009. I was awarded a Lifetime Achievement Award 2011 by the Dr. MGR Medical University for my contribution in Cardiology by the Governor of Tamil Nadu, His Excellency Mr. Rosiah.

My interests include Interventional Cardiology, Vascular Imaging, Clinical Research and Research in Basic Cardiac Sciences. I have participated as Faculty in several interventional meetings including most of the major interventional courses all over the world. The Advanced Cardiovascular Therapeutics, which is one of the major interventional courses held in India, has been held consecutively for the last 10 years at the Institute of Cardio-Vascular Diseases, Madras Medical Mission with me as the Course Director.

I have published 180 peer-reviewed papers and around 200 abstracts in peer reviewed journals. I have been the Primary Investigator in the last 5 years in 21 major National / International trials. I have served as a Member of the Task Force for Stem Cell Research, Dept. of Biotechnology, Government of India. I have been the Chief Editor of the Journal of the Institute of Cardio-Vascular Diseases and serve on the Editorial Board for Interventional Cardiology in the Indian Heart Journal.

I have been an examiner for the DNB Cardiology (National Board of Cardiology), FNB Cardiology (National Board of Interventional Cardiology) and MRCP (PACES).

On the social front, I am a founder trustee for SANKALP, a school for autistic and learning disability children in Chennai catering to 250 children with these disabilities. This school is one of the largest schools for autism spectrum disorder in the country and holds a yearly congress for special needs called “LEARN”. I have been awarded the Melvin Jones Millennium Award 2011 for community service by the Lions Club International issued by the Lions Club District Governor. I have actively participated in multiple rural health camps in Kerala and Tamil Nadu prominent of which has

been the ‘Hridayapoorvam’ and ‘Hridayapoorvam Sakhyam’ with the Malayala Manorama group.

Some important papers published as author

Minxian Wang, Ramesh Menon, Sanghamitra Mishra, Aniruddh P. Patel, Mark Chaffin, Deepak Tanneeru, Manjari Deshmukh, Oshin Mathew, Sanika Apte, Christina S. Devanboo, Sumathi Sundaram, Praveena Lakshmipathy, Sakthivel Murugan, Krishna Kumar Sharma, Karthikeyan Rajendran, Sam Santhosh, Rajesh Thachathodiyl, Hisham Ahamed, Aniketh Vijay Balegadde, Thomas Alexander, Krishnan Swaminathan, Rajeev Gupta, **Ajit S. Mullasari**, Alben Sigamani, Muralidhar Kanchi, Andrew S. Peterson, Adam S. Butterworth, John Danesh, Emanuele Di Angelantonio, Aliya Naheed, Michael Inouye, Rajiv Chowdhury, Ramprasad L. Vedam, Sekar Kathiresan, Ravi Gupta, Amit V. Khera. Validation of a Genome-Wide Polygenic Score for Coronary Artery Disease in South Asians. *Journal of the American College of Cardiology*, 2020;76(6):703-714 (**IF: 20.589**)

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Ramachandran S, Anandan V, Kutty VR, **Mullasari A**, Radhakrishna Pilla M, Kartha CC. Metformin attenuates effects of cyclophilin A on macrophages, reduced lipid uptake and secretion of cytokines by repressing decreased AMPK activity. *Clinical Science* (2018) 132 719-738. <https://doi.org/10.1042/CS20171523> (**IF: 5.237**)

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V, Gnanaraj JP, Narula J, Kumbhani DJ, Nallamothu BK. A System of Care for Patients with ST-Segment Elevation Myocardial Infarction in India. The Tamil Nadu-ST-Segment Elevation Myocardial Infarction Program. JAMA Cardiol. 2017 May 1;2(5):498-505. doi: 10.1001/jamacardio.2016.5977 (IF:12.8).

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Corrections – IACS Honour and Award Recipients (shown in red)

A. Academy's Honour and Award Recipients:

1. Lifetime Achievement Award in Cardiovascular Science, Medicine and Surgery:

1. Newman Stephens: Winnipeg, Canada	2005	23. S. S. Agrawal: New Delhi, India	2015
2. Onkar Tripathi: Lucknow, India	2005	24. Edwin E. Daniel: Victoria, Canada	2015
3. Keld Kjeldsen: Copenhagen, Denmark	2005	25. Irving Zucker: Omaha, USA	2015
4. Wagner Padua Filho: Belo Horizonte, Brazil	2005	26. Dragan Djuric: Belgrade, Serbia	2015
5. Bohuslav Ostadal: Prague, Czech Republic	2005	27. Horacio Cingolani: La Plata, Argentina	2015
6. Donald Beanlands: Ottawa, Canada	2006	28. Mohammad A.Q. Siddiqui: New York, USA	2015
7. Stig Haunso: Copenhagen, Denmark	2009	29. M. Sankaran V. Valiathan: Manipal, India	2015
8. Jay Cohn: Minneapolis, USA	2009	30. Noboru Yamazaki: Hamamatsu, Japan	2015
9. Jan Slezak: Bratislava, Slovak Republic	2009	31. Ismail Sallam: Cairo, Egypt	2016
10. Elizabeth Roth: Pecs, Hungary	2010	32. Andras Varro: Szeged, Hungary	2016
11. Otoni Gomes: Belo Horizonte, Brazil	2010	33. Philip J. Kadowitz: New Orleans, USA	2017
12. Keyur Parikh: Ahmedabad, India	2010	34. Karl T. Weber: Memphis, USA	2017
13. Ramesh Goyal: Vadodara, India	2011	35. Mark Entman: Houston, USA	2017
14. Belma Turan: Ankara, Turkey	2011	36. William B. Weglicki: Washington, USA	2017
15. Stephen F. Vatner: Newark, USA	2011	37. Grant Pierce: Winnipeg, Canada	2018
16. Yogendra K. Gupta: New Delhi, India	2012	38. Gary Lopaschuk: Edmonton, Canada	2018
17. Nobuakira Takeda: Tokyo, Japan	2012	39. Asher Kimchi: Los Angeles, USA	2019
18. Irving Joshua: Louisville, USA	2012	40. Suresh Gupta: New Delhi, India	2019
19. John H. McNeill: Vancouver, Canada	2014	41. Jawahar L. Mehta: Little Rock, USA	2019
20. Dennis B. McNamara: New Orleans, USA	2014	42. Pavel Hamet: Montreal, Canada	2019
21. Attila Ziegelhoffer: Bratislava, Slovakia	2014	43. Vladimir Jakovljevic: Kragujevac, Serbia	2019
22. James Parratt: Glasgow, Scotland	2014	44. C.C. Kartha, Trivandrum, India	2020

2. Distinguished Leadership Award in Cardiovascular Sciences:

1. Jacques Genest: Montreal, Canada	2001	18. Enrique Castaneda Saldana: Lima, Peru	2015
2. Ruth Collins-Nakai: Edmonton, Canada	2001	19. Tejal Gandhi: Anand, India	2016
3. Elizabeth Roth: Pecs, Hungary	2013	20. Ghassan Bkaily: Sherbrook, Canada	2016
4. Karl Werdan: Halle, Germany	2013	21. Jose Carlos Dorsa Vieira Pontes: Belo Horizonte, Brazil	2016
5. Salim Yusuf: Hamilton, Canada	2013	22. Arunabha Ray: New Delhi, India	2017
6. Otoni Gomes: Belo Horizonte, Brazil	2013	23. Dinender K. Singla: Orlando, USA	2017
7. Suresh K. Gupta: New Delhi, India	2014	24. Ferenc Gallyas Jr.: Pecs, Hungary	2017
8. Alan H. Menkis: Winnipeg, Canada	2014	25. Sankar Natesan: Madurai, India	2018
9. Karl Weber: Winnipeg, Canada	2014	26. Tatiana Ravingerova: Bratislava, Slovak Republic	2018
10. Ricardo Gelpi: Buenos Aires, Argentina	2014	27. Jan Slezak, Bratislava: Slovak Republic	2018
11. Andras Varro: Szeged, Hungary	2014	28. Eduardo Rivas-Estany: Havana, Cuba	2018
12. Miroslav Barancik: Bratislava, Slovak Republic	2015	29. José Wanderley Neto: Maceio-AL, Brazil	2018
13. Devendra K. Agrawal: Omaha, USA	2015	30. CN Manjunath: Bangalore, India	2019
14. Chandrasekharan C. Kartha: Trivandrum, India	2015	31. Madhu Khullar: Chandigarh, India	2019
15. Vladimir Jakovljevic: Belgrade, Serbia	2015	32. Dragan M. Djuric: Belgrade, Serbia	2019
16. Shyam S. Agrawal: Noida, India	2015	33. Belma Turan: Ankara, Turkey	2019
17. Melchior Luiz Lima: Vitoria, Brazil	2015	34. Ramesh K. Goyal, New Delhi, India	2020

3. Distinguished Service Award in Cardiovascular Science, Medicine and Surgery:

1. Pavel Braveny: Brno, Czech Republic	2003	27. Ferenc Gallyas Jr.: Pecs, Hungary	2013
2. Otoni Gomes: Belo Horizonte, Brazil	2003	28. Monika Bartekova: Bratislava, Slovak Republic	2014
3. Elizabeth Roth: Pecs, Hungary	2003	29. Michael Czubryt: Winnipeg, Canada	2014
4. Vijay K. Puri: Lucknow, India	2004	30. George Jackowski: Woodbridge, Canada	2015
5. Suresh K Gupta: New Delhi, India	2004	31. Surya Ramachandran: Thiruvananthapuram, India	2015
6. Fause Attie: Mexico City, Mexico	2004	32. Elias Kallas: Pouso Alegre, Brazil	2015
7. Daniel Villarreal: Syracuse, USA	2004	33. Anita Mehta: Ahmedabad, India	2016
8. Haruo Naito: Tokyo, Japan	2004	34. Jyotsnaben Patel: Anand, India	2016
9. Ramesh K Goyal: Vadodara, India	2005	35. Ivan Berkowitz: Winnipeg, Canada	2016
10. Belma Turan: Ankara, Turkey	2005	36. Danielle Jacques: Sherbrooke, Canada	2016
11. David Brasil: Belo Horizonte, Brazil	2005	37. Hideo Kumamoto: Tokyo, Japan	2016
12. Wagner Padua Filho: Belo Horizonte, Brazil	2005	38. Pierre Reid: Sherbrooke, Canada	2016
13. Dennis McNamara: New Orleans, USA	2005	39. Istvan Bacsko: Szeged, Hungary	2016
14. Hideaki Kawaguchi: Sapparo, Japan	2006	40. Samir Saadeddine Jr.: Belo Horizonte, Brazil	2016
15. Robert Kalina: Oakville, Canada	2008	41. Kavita Gulati: New Delhi, India	2017
16. Frantisek Kolar: Prague, Czech Republic	2008	42. Sampath Parthasarathy: Orlando, USA	2017
17. Keld Kjeldsen: Copenhagen, Denmark	2009	43. William M. DeCampi: Orlando, USA	2017
18. Attila Ziegelhoffer: Bratislava, Slovak Republic	2010	44. Ricardo Adala Benfatti: Campo Grande, Brazil	2017
19. Milan Chag: Ahmedabad, India	2011	45. Andiappan Rathinavel: Madurai, India	2018
20. Balram Bhargava: New Delhi, India	2012	46. Delfin Rodriguez-Leyva: Winnipeg, Canada	2018
21. Subir K. Maulik: New Delhi, India	2012	47. Melchior Luiz Lima: Vitoria, Brazil	2018
22. Elaine Maria Gomes Freitas: Belo Horizonte, Brazil	2012	48. SR Kalpana: Bangalore, India	2019
23. Elton Silva Gomes: Belo Horizonte, Brazil	2012	49. Vladimir Zivkovic: Kragujevac, Serbia	2019
24. Tanya Ravingerova: Bratislava, Slovak Republic	2013	50. Ivan Srejovic: Kragujevac, Serbia	2019
25. Suresh Tyagi: Louisville, USA	2013	51. Kamil Can Akcali: Anakara, Turkey	2019
26. Ursula Muller Werdan: Halle, Germany	2013	52. Harvinder Popli, New Delhi, India	2020

4. Exemplary Service Awards for Promoting Heart Health:

1. Nikolaus (Klaus) Lahr: Winnipeg, Canada	2018	3. Yetta & Jack Levit Family: Winnipeg, Canada	2018
2. Kamta Roy Singh: Winnipeg, Canada	2018	4. Sonny Dhalla: Brandon, Canada	2018

C. North American Section Award Recipients:

1. Howard Morgan Award for Distinguished Achievements in Cardiovascular Research:

1. Laszlo Szekeres: Szeged, Hungary	2002	8. Sumeet Chugh: Los Angeles	2013
2. K. Gopal Nair: Mumbai, India	2003	9. Jagat Narula: New York, USA	2014
3. Shunzo Onishi: Tokyo, Japan	2004	10. Bruce McManus: Vancouver, Canada	2015
4. Roberto Bolli: Louisville, USA	2005	11. Morris Karmazyn: London, Canada	2016
5. Heinz Gerd Zimmer: Leipzig, Germany	2006	12. Gary Lopaschuk: Edmonton, Canada	2017
6. Dipak Das: Farmington, USA	2009	13. Lorrie Kirshenbaum: Winnipeg, Canada	2018
7. Subodh Verma: Toronto, Canada	2011	14. Martin Morad: Charleston, USA	2019

2. Makoto Nagano Award for Distinguished Achievements in Cardiovascular Education:

1. Chong-Chin Liew: Boston, USA	2002	8. David Lefer: Atlanta, USA	2013
2. Bal K. Sharma: Panchkula, India	2003	9. Martin Morad: Charleston, USA	2014
3. Bruce McManus: Vancouver, Canada	2004	10. Suresh K. Gupta: New Delhi, India	2015
4. Karl Weber: Memphis, USA	2005	11. Grant N. Pierce: Winnipeg, Manitoba	2016
5. John Solaro: Chicago, USA	2006	12. András Varró: Szeged, Hungary	2017
6. Agnes Vegh: Szeged, Hungary	2009	13. Chandrasekharan C. Kartha: Trivandrum, India	2018
7. Zoltan Papp: Debrecen, Hungary	2011	14. Buddhadeb Dawn: Las Vegas, USA	2019

3. Naranjan Dhalla Award for Innovative Investigators in Cardiovascular Sciences:

1. Aiji Sakamoto: Tokyo, Japan	2002	8. Andras Varro: Szeged, Hungary	2013
2. Luiz Souza: Curitiba, Brazil	2003	9. Morris Karmazyn: London, Canada	2014
3. Sukhinder Cheema: St. John's, Canada	2004	10. Jan Slezak: Bratislava, Slovak Republic	2015
4. Richard Schulz: Edmonton, Canada	2005	11. André Carpentier: Sherbrooke, Canada	2016
5. Balwant S. Tuana: Ottawa, Canada	2006	12. Gary Lopaschuk: Edmonton, Canada	2017
6. Hideo Baba: Essen, Germany	2009	13. Andrew Marks: New York, USA	2018
7. Gary Baxter: Cardiff, Wales	2011	14. Dr. Ren-Ke Li: Toronto, Canada	2019

4. Norman Alpert Award for Established Investigators in Cardiovascular Sciences:

1. Jan Slezak: Bratislava, Slovak Republic	2002	8. Rakesh C. Kukreja: Richmond, USA	2013
2. Bohuslav Ostadal: Prague, Czech Republic	2003	9. Gary Lopaschuk: Edmonton, Canada	2014
3. Nirmal K. Ganguly: New Delhi, India	2004	10. Aruni Bhatnagar: Louisville, USA 2	2015
4. Kewal K. Talwar: Chandigarh, India	2005	11. Peter Backx: Toronto, Canada	2016
5. Seiryu Suguira: Tokyo, Japan	2006	12. Michael P. Czubryt: Winnipeg, Canada	2017
6. Stephen Schaffer: Mobile, USA	2009	13. Lorrie Kirshenbaum: Winnipeg, Canada	2018
7. Grant Pierce: Winnipeg, Canada	2011	14. Peter Ferdinandy: Budapest, Hungary	2019

5. James Willerson Award for Excellence in Cardiovascular Medicine:

1. Four Symposium Speakers: Winnipeg, Canada	2013	5. Four Symposium Speakers: Havana, Cuba	2017
2. Four Symposium Speakers: Omaha, USA	2014	6. James Weiss: Los Angeles, USA	2018
3. Four Symposium Speakers: Sherbrook, Canada	2015	7. Marek Michalak: Edmonton, Canada	2019
4. Four Symposium Speakers: Orlando, USA	2016		

F. India Section Award Recipients:

1. Suresh Gupta Oration Award in Cardiovascular Sciences:

1. Bohuslav Ostadal: Prague, Czech Republic	2014	5. Pawan Singal: Winnipeg, Canada	2017
2. Morris Karmazyn: London, Canada	2015	6. Peter Nanasi: Debrecen, Hungary	2018
3. Dinender K. Singla: Orlando, USA	2015	7. Mahesh P. Gupta: Chicago, USA	2019
4. Grant Pierce: Winnipeg, Canada	2016	8. Lorrie A. Kirshenbaum: Winnipeg, Canada	2020

2. Ramesh Goyal Oration Award in Cardiovascular Sciences:

1. Grant Pierce: Winnipeg, Canada	2014	5. Madhu Anand Srivastava: Montreal, Canada	2018
2. Ghassan Bkaily: Sherbrooke, Canada	2015	6. Paul K. Ganguly: Riyadh; Saudi Arabia	2019
3. Chandrasekharan C. Kartha: Trivandrum, India	2016	7. Buddhadeb Dawn: Las Vegas, USA	2020
4. Om Parkash Yadava: New Delhi, India	2017		

3. Harpal Buttar Oration Award in Cardiovascular Sciences:

1. Shyam S. Agrawal: New Delhi, India	2014	5. Rajesh Kumar: Chandigarh, India	2018
2. Devendra Agrawal: Omaha, USA	2015	6. Vijaya M. Nayak: Bangalore, India	2019
3. Dinender K. Singla: Orlando, USA	2016	7. Atul Abhyankar: Surat, India	2020
4. Viswanathan Mohan: Chennai, India	2017		

4. Rakesh Kukreja Oration Award in Cardiovascular Sciences:

1. Balram Bhargava: New Delhi, India	2017	3. Shivakumar: Trivandrum, India	2019
2. Vivek Jawali: Bangalore, India	2018	4. Vandana Patravale: Mumbai, India	2020

G. Other Awards in Cardiovascular Sciences:

1. Suresh C. Tyagi Young Faculty Awards:

1. Vibha Rani (1st)	2017	5. V. T. Siddharth	2018
2. Kashif Hanif	2017	6. Kalaivani V.	2019
3. Suman Kundu	2017		
4. Hital Shah	2017		

2. Devendra Agrawal Young Investigators Awards:

1. M. Kiranmayi (1st)	2017	4. Nikita Setia	2017
2. Harikesh Dubey	2017	5. Navdha Vyas	2018
3. Vikas A.	2017	6. Raghu Bhushan	2019

3. Paul and Riya Ganguly Symposium Awards:

3. Sandhya Sitasawad	2020	1. Biju Soman:	2020
4. Anil N. Gaikwad	2020	2. Bhoomika Patel:	2020

4. Naranjan S. Dhalla Poster Awards:

1. Kavitha Sashidharan,	2015	9. Sentamizharsi Manivasagam	2018
2. Shammy Saphia	2015	10. Aditi Jain	2018
3. Jaya Mary Thomas	2016	11. Vinitha A	2018
4. Vinitha A.	2016	12. Mrudula Spurti	2018
5. Kumaravelu Jagavelu	2017	13. Anjali Roy	2019
6. Aditi Jain	2017	14. Vinitha A	2019
7. Jaya Mary Thomas	2017	15. R. Dhanya	2019
8. Vinitha A.	2017		

5. C. C. Kartha Student Travel Awards:

1. M. Kiranmayi	2017	11. Manisha Saini	2019
2. Vinitha A.	2017	12. Aneesh Kumar	2019
3. Jaya Mary Thomas	2017	13. Jayalekshmi	2019
4. Jaganmay Sarkar	2017	14. Karthika CL	2019
5. Vikas A.	2017	15. Ankita Bane	2019
6. Nimmy Mohan	2017	16. Shyamashree Banerjee	2019
7. Moon Jain	2017	17. Lakshmi Lavanya Reddy	2019
8. Lakshmi Lavanya	2017	18. Sana Nafees	2019
9. Aditi Jain	2017	19. Binu Prakash	2019
10. Gaurav Kumar	2019		

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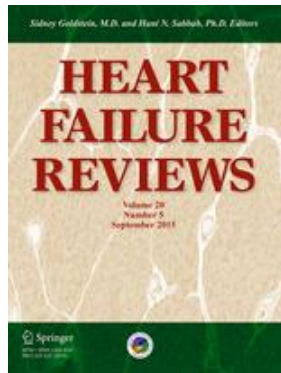
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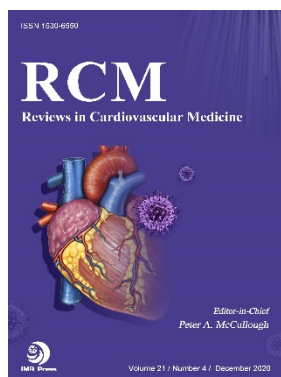
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4. *Reviews in Cardiovascular Medicine*

Readers are encouraged to submit
original research articles and reviews to
these partnering journals.

**7th MEETING OF THE EUROPEAN SECTION AND
8th MEETING OF THE NORTH AMERICAN SECTION OF THE INTERNATIONAL ACADEMY OF
CARDIOVASCULAR SCIENCES (IACS)**

**"CARDIOPROTECTION AND CARDIOMETABOLIC DISEASES:
FROM BENCH TO BEDSIDE"**

- IN A HYBRID FORMAT -

20-23 September 2021

Banja Luka, The Republic of Srpska, Bosnia & Herzegovina

FIRST ANNOUNCEMENT



Venue

Banski dvor - City Culture Centre

Organised by

*International Academy of Cardiovascular Sciences (IACS) - European and North American Sections
Faculty of Medicine, University of Banja Luka, The Republic of Srpska, Bosnia & Herzegovina
Serbian Association for Arteriosclerosis, Thrombosis and Vascular Biology Research, Belgrade, Serbia
Association for Atherosclerosis and Cardiovascular Research, Banja Luka, The Republic of Srpska, Bosnia & Herzegovina*

www.iacs2021.com

FOREWORD

We are very pleased to inform you that the 7th Meeting of European Section and 8th Meeting of North American Section of the International Academy of Cardiovascular Sciences (IACS) will be jointly held during 20-23 September 2021 in Banja Luka, the Republic of Srpska, Bosnia and Herzegovina, in a hybrid format. The well-known COVID-19 pandemic in 2020 caused a cancellation of the European Section and North American Section IACS meetings in Banja Luka and Montreal, respectively. In order to overcome this obstacle, while taking advantage of the currently more favourable epidemiological situation in the Balkans, it was decided to allow the presenters who are at liberty to come to Banja Luka to have floor presentations, reserving the time slots for those prominent scientists from around the globe who cannot do that, to participate online. We believe that the hybrid format of the meeting will allow us to create the best meeting possible.

Banja Luka and its Faculty of Medicine has long been a centre of cardiovascular research, which was even more strengthened since 2018, when the Centre for Biomedical Research was established within this faculty. Previous results in the field of cardiovascular research prompted us to apply for the organisation of this IACS conference, in order to improve our research foundations and make easier access to global research cooperation.

Our wish is to attract the researchers from abroad and especially from the surrounding countries. This time,

the IACS meeting is named “Cardioprotection and Cardiometabolic Diseases: From Bench to Bedside “. It is focused on cardioprotection, cardiometabolic diseases, risk factors, oxidative stress and inflammation, genetics, epidemiology, prevention, nutrition, exercise and hyperbaric physiology however translational and applied aspects in cardiovascular research will be also presented. The scientific programme will include a broad mix of topics from molecular, cellular, clinical and integrative aspects of cardiovascular sciences going ahead to the scientific problems covered by the international scientific community.

We do hope that this meeting is a unique opportunity for all participants to exchange their ideas and give their own contribution to this fruitful cooperation. Finally, Banja Luka, the capital of the Republic of Srpska, is a place rich in history, monuments, recreational areas, museums and galleries. Today, Banja Luka is not only a vibrant university centre, but also an oasis of good energy and beauty and a well-developed tourist destination, popular among domestic and foreign guests seeking a relaxing getaway in the countryside and an adventurous rafting in the canyon of the river Vrbas. Our venue – the Centre of Culture *Banski Dvor* (Governor’s Palace) offers excellent conditions for scientific meetings, as this one certainly is.

We appreciate your participation, wishing you a warm welcome to Banja Luka and the Republic of Srpska, Bosnia and Herzegovina.

On behalf of the Organising & Programme Committee,

Ranko Škrbić, Meeting Chair

Miloš P Stojiljković, Meeting Co-Chair

Meeting Chair & Meeting Co-Chair/Organising & Programme Committee

Ranko Škrbić, Banja Luka, Republic of Srpska, Bosnia and Herzegovina

Miloš P Stojiljković, Banja Luka, Republic of Srpska, Bosnia and Herzegovina

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Roberto Bolli, President, IACS (Louisville, KY, USA)

Naranjan S Dhalla, Founder and CEO, IACS (Winnipeg, MB, Canada)

Gary Lopaschuk, President, North American Section, IACS (Edmonton, AB, Canada)

Bohuslav Oštádal, Past President, IACS (Prague, Czech Republic)

Grant N Pierce, President-Elect, IACS (Winnipeg, MB, Canada)

Andras Varro, President, European Section, IACS (Szeged, Hungary)

International Programme Committee/Proposed List of Speakers

Devendra K Agrawal, Pomona, CA, USA
Madhu Anand-Srivastava, Montreal, QC, Canada
Istvan Bacsko, Szeged, Hungary
Maciej Banach, Lodz, Poland
Ghassan Bkaily, Sherbrooke, QC, Canada
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Tonino Bombardini, Pisa, Italy
Harpal S Buttar, Ottawa, ON, Canada
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Buddhadeb Dawn, Las Vegas, NV, USA
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Sanjiv Dhir, Winnipeg, MB, Canada
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Lorrie A Kirshenbaum, Winnipeg, MB, Canada

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Vincenzo Lionetti, Pisa, Italy
Gary Lopaschuk, Edmonton, AB, Canada
Martin Morad, Charleston, SC, USA
Danina Muntean, Timisoara, Romania
Bohuslav Oštádal, Prague, Czech Republic
Grant N Pierce, Winnipeg, MB, Canada
Tanya Ravingerova, Bratislava, Slovakia
Pawan K Singal, Winnipeg, MB, Canada
Dinender Singla, Orlando, FL, USA
Jan Slezak, Bratislava, Slovakia
Ashok K Srivastava, Montreal, QC, Canada
Paramjit Tappia, Winnipeg, MB, Canada
Christoph Thiernemann, London, UK
Srinivas Tipparaju, Tampa, FL, USA
Suresh C. Tyagi, Louisville, KY, USA
Andras Varro, Szeged, Hungary
Nathan D Wong, Irvine, CA, USA

(Several other invited speakers are being contacted)

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Milkica Grabež, Banja Luka

Žana M Maksimović, Banja Luka
Nataša Miljuš, Banja Luka
Sonja Trbojević, Banja Luka

Scientific Topics

- COVID-19 and cardiovascular system
- Transcription, translation and epigenetics in heart failure
- Advances in arrhythmia research
- Translating basic discoveries into clinical applications
- Advances in cardiovascular protection and therapy
- Structure–function consequences of cardiac ryanodine receptors mutations and implication to arrhythmogenesis
- Advances in cardiovascular biology, atherosclerosis and hypertension
- Cardioprotective strategies in diabetes

- Hyperbaric oxygenation in cardiometabolic disease
- Mitochondrial dysfunction in heart disease
- Advances in cardiovascular toxicity
- Exosomes and stem cells in cardiovascular therapy
- Brain-heart axis and advances in adipobiology
- Mechanisms contributing to heart failure and ischemic heart disease
- Advances in cardiovascular diagnostics and treatment
- Pathology of heart failure
- Molecular mechanisms involved in stress

Accreditation

This event has been accredited by the Ministry of Health, the Republic of Srpska with 15 CME credits. Each participant will receive a certificate of attendance upon completion of the event.

Awards

Oral presentations

Two awards competitions for young investigators will be organised at this meeting:

Roberto Bolli Awards Competition for Postdoctoral Fellows and Junior Faculty – 4 speakers will be invited.

Garry Lopaschuk Awards Competition for Graduate Students – 5 speakers will be invited.

Poster presentations

Two poster sessions will be organised, one on 21 and the other on 22 September 2021. A total of 12 poster awards will be given. These awards will be named after Morris Karmazyn (4), Karl Werdan (2), Margaret Moffat (4) and Attila Ziegelhoffer (2).

Established Investigator Award

Several investigators will be honoured during the Awards Ceremony with named awards such as Alpert, Dhalla, McNamara, Mehta, Morgan, Ostadal, Pierce, Slezak, Varro and Willerson Awards for their Leadership and Excellence in Cardiovascular Science.

Abstracts

Deadline for the abstract submission is 31 August 2021.

Title – Try to be concise.

Authors – On a right hand side a field with spaces for full names, email address and affiliation for each author can be found. By clicking on “+”, additional fields for co-authors can be opened.

Body of abstract – Its length is limited to 350 words.

In case that the presentation itself brings original data from experiments or clinical trials, please make a structured abstract with following sections: Background/Aim, Methods, Results, Conclusion.

In case that the presentation itself is more of a review or a state-of-the-art type, please write a nonstructured abstract.

Key words – Please, write 3-5 key words, with the capitalised first letter.

References – Up to three references are allowed. In the text, they should be marked with arabic numerals – eg, (1), (2), (3). Below the abstract, whole references should be written, according to the Vancouver style.

Example: Lopes HF, Egan BM. Visceral adiposity syndrome and cardiometabolism. *Scr Med* 2021 Jun;52(2):144-50.

Instruction for abstracts can be found and their submission made on the official meeting website

www.iacs2021.com.

Important Information

Meeting date

20-23 September 2021

Registration

The registration desk will be open on:

20 September 2021, from 14 h to 18:30 h

21 September 2021, from 8 h to 18:30 h

22 September 2021, from 8 h to 18:30 h

23 September 2021, from 8 h to 13 h.

Technical Organiser

Travel Agency ZEPTER PASSPORT, Banja Luka, Veselina Maslese 8, 78000 Banja Luka, RS, Bosnia and Herzegovina

info@zepterpassport.com mob. + 387 65 880 960

www.zepterpassport.com

Registration information

Type of participant	Early bird registration (until 7 August 2021)	Registration from 8 August 2021
Researchers (with the exception of invited speakers)	€105	€160
Students*	€80	€100

*Status to be documented by the Dean's letter

The registration fees include attendance to meeting sessions, opening cocktail, gala dinner and welcome reception, coffee breaks and congress bag, with social program.

Cancellation Policy

Registration payments will be refunded as 50% of the payment if a written cancellation is received by ZEPTER PASSPORT before 31 August 2021. There will be no refund for cancellations received after 31 August 2021.

Hotel Accommodation

Room type	Hotel Bosna
Single Room	€68
Double/Twin room	€92

*price per day, tax included, service B&B

Registration and accommodation forms can be found on the official meeting website

www.iacs2021.com

Full-Length Papers

Certain number of presentations will be selected and invited to be published as full-length papers in a special issue of the internationally recognised journal *Canadian Journal of Physiology and Pharmacology*. This option will be possible upon invitation and following a peer- review procedure.

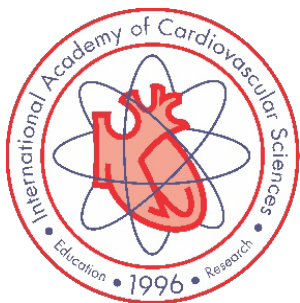
Organising & Programme Committee Contacts

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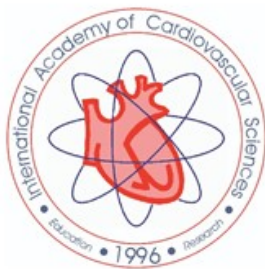


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**NORTH AMERICAN MEETING OF THE INTERNATIONAL
SOCIETY FOR HEART RESEARCH AND INTERNATIONAL
ACADEMY OF CARDIOVASCULAR SCIENCES**

SEPTEMBER 13-17, 2022



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University of Manitoba



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R3021 - 351 Taché Avenue
Winnipeg, MB, R2H 2A6
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